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ABSTRACT

This manual presents a suggested methodology for secondary and postsecondary vocational education school systems which can be used in designing new programs and courses and in maintaining or modifying existing programs or courses for the purpose of developing student skills which correspond to the employer-required skills necessary for successful entry-level employment. This process is intended to provide users with a uniform and systematic method for organizing current job tasks, skills, and knowledges presently taught from vocational education course outlines. The organization of the manual divides the process into four unique procedures, each requiring a separate form to be completed. These four procedures are the following: (1) identification of Dictionary of Occupational Title (DOT) codes, titles, and critical factors with the United States Office of Education (USOE) codes, titles and descriptors; (2) development of competencies based on DOT definitions; (3) establishment of course content framework; and (4) development of course competency outlines. Several materials are appended, including a course outline, instructional analysis guide, performance objectives, and definitions of terms. (BM)

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COICC

California Occupational Information
Coordinating Committee

Presents a Vocational Education
Part C Research Project
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TASK ANALYSIS

A Process Manual for the Development of New and or Modification of Instructional Curricula

CE 022 199

Published 1978

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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INTRODUCTION

Competencies in the form of tasks, skills, and knowledge serve as a basis for formulating performance objectives at the program level. The selection of job tasks must be made in accordance with the levels of proficiency a particular program is designed to achieve.

The Task Analysis Process is intended to increase the job relevance of vocational education by identifying the discrepancies between the employer's occupational requirements such as tasks or skills, and the knowledge actually being taught by the vocational education curriculum.

The COICC project staff has developed and prepared a suggested methodology for secondary and postsecondary vocational education school systems which can be used in (a) designing new programs and courses, and (b) maintaining or modifying existing programs or courses for the purpose of developing student skills which correspond to the employer-required skills necessary for successful entry-level employment. This process is intended to provide users with a uniform and systematic method for organizing current job tasks, skills, and knowledges presently taught from vocational education course outlines.

The problems facing vocational education administrators, planners, teachers, and State Board staff researchers and counselors in conducting an on-going task analysis are complex. Their resolution requires obtaining, analyzing and utilizing data pertinent to labor market needs, employer needs, and people needs so that occupational programs can maintain "competency-based training objectives."

PREFACE

"Task Analysis is a systematic way of finding out what functions and tasks are included in a given job or position."[1] It is a way of describing the basic unit of work (the task) that is being performed by a worker in a way that is definable, measurable, and communicable. Task Analysis indicates what a person actually "does" rather than what he or she is "responsible" for.

Task Analysis procedures allow the analyst to measure and make judgments about each task the worker performs on the job by supplying information on the following items:

1. WORKER FUNCTIONS: The relationship in a task of the worker's relative involvement with data, people, and things.
2. INSTRUCTIONAL LEVEL: The amount of instruction the worker receives from his or her supervisor and leeway (discretion) that is allowed in performing the task.
3. EDUCATION LEVEL: The required reasoning development, mathematical development, and language development the worker must possess in order to perform successfully the tasks that make up the job.
4. TRAINING CONTENT: The functional skills, knowledges, and abilities a person must possess in order to come into a new job and achieve average success; and, the specific skills, knowledges and abilities unique to the task which he or she will be required to acquire while on the job.

These measurements, in addition to the task statements themselves, tell us quite a bit about the worker's relationship with the work being performed. A task statement is the fundamental unit of task analysis. A task is defined as, "an action or sequence of actions that contribute significantly to the completion of a specific work objective."[2] A task may be primarily physical, such as operating a typewriter; mental, such as analyzing data, or interpersonal, such as consulting with another person.

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[1] Task Analysis, New Careers Training lab., New York University 1971, pg. 5-6

Tasks are expressed in the format known as the TASK STATEMENT. This is the single most important element of the Task Analysis Process. The TASK STATEMENT provides a standardized, concise format to describe worker actions. The data which it yields will provide information to: (a) identify valid skill requirements and minimum qualifications; (b) develop or modify training program; (c) provide better understanding to the supervisor and worker of exactly what the worker's duties are for satisfactory job performance.

The rationale for establishing a Task Analysis process arises from the recognition that far too often the content of vocational education programs is based upon the intuitive perception (or misperception) of teachers and administrators of the skills and knowledges required for adequate performance in a given job. To keep this kind of situation from adversely affecting the operation of vocational education programs, the project staff, in conjunction with the State Department of Education, felt it necessary to establish a methodology to accomplish the following:

1. utilization of Task Analysis to develop or modify curriculum for new and existing programs and courses, and

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[2] Task Analysis, New Careers Training Lab., New York University 1971, pg. 5-6

2. the matching of the specific occupational tasks to the tasks which are presently being taught as identified in vocational education course outlines.

The requirements contained in Activities #1 and #2, Area 4 of the project grant's descriptor, were reviewed. As a result the Dictionary of Occupational Titles (DOT), Fourth Edition, 1977, was selected as the primary source for providing the needed task data for the following reasons:

1. The Dictionary of Occupational Titles (DOT) is a widely utilized reference book which includes standardized and comprehensive descriptions of job and task duties and related information for more than 20,000 occupations.

2. The information presented in the Dictionary of Occupational Titles represents a composite summary of comprehensive data collection technique know as job analysis. The result of the job analysis technique is recorded on a standardized form known as the "Job Analysis Schedule." The job analysis involves a systematic study of the worker in terms of:

    a. what the worker does in relation to data, people and things (Worker Functions),

    b. the methodologies and techniques employed (Work Field),

    c. the machines, tools, equipment, and work aids used (MTEWA),

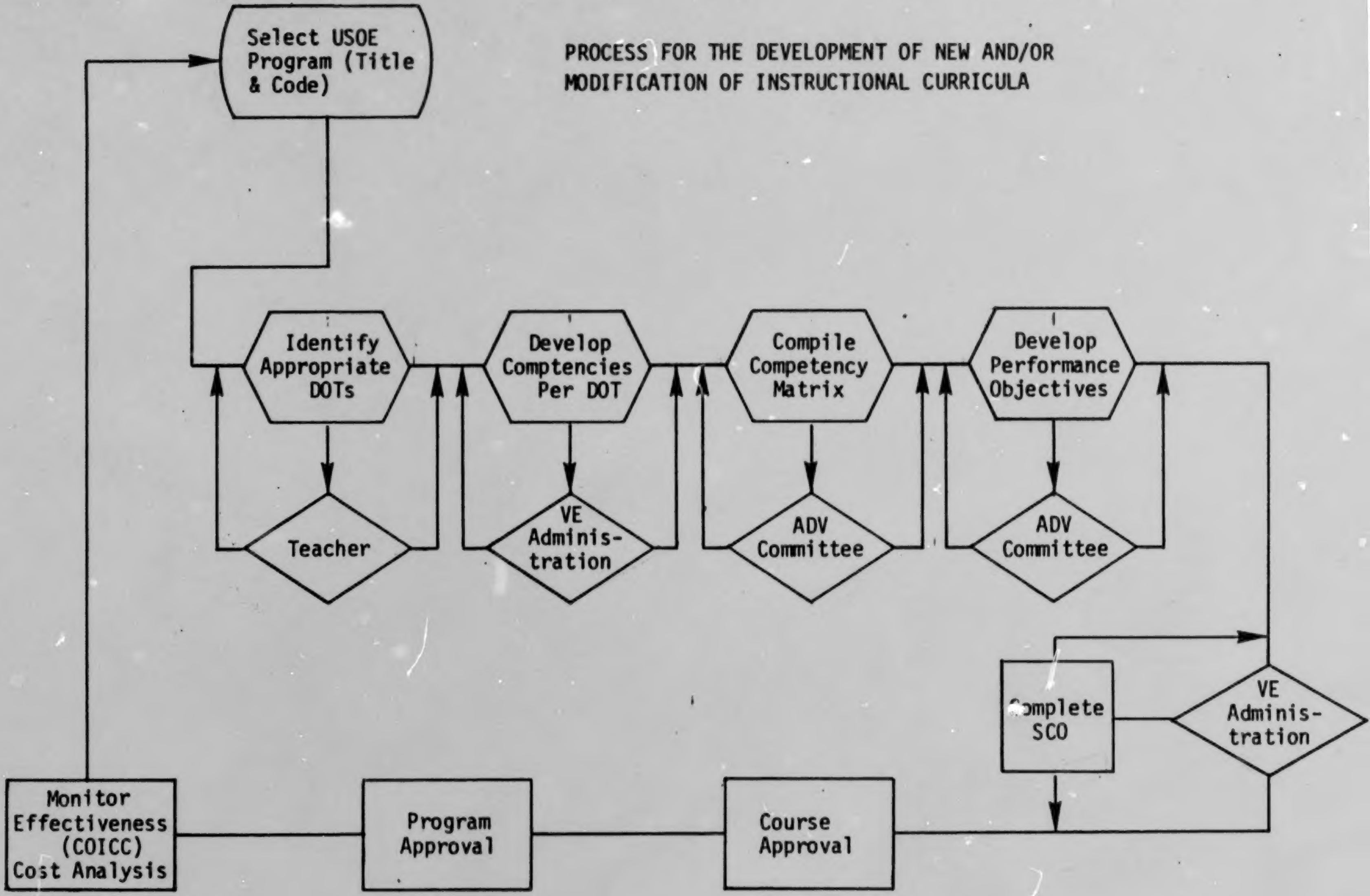
    d. the materials, products, subject matter, or services which result (MPSMS), and

    e. the traits required of the worker (Worker Traits).

3. The State Educational Records and Report Series, Handbook VI, established by the USOE is an educational reporting system. Certain portions of the Handbook VI pertain to vocational education. Working with the Department of Labor, the U.S. Office of Education published Vocational Education and Occupations (VEO). This publication was the first attempt to establish a relationship between handbook VI codes and DOT codes.

TASK
ANALYSIS
PROCESS

PROCESS FOR THE DEVELOPMENT OF NEW AND/OR MODIFICATION OF INSTRUCTIONAL CURRICULA


Select USOE Program (Title & Code)
Identify Appropriate DOTs
Teacher
Develop Comptencies Per DOT
VE Adminis-tration
Compile Competency Matrix
ADV Committee
Develop Performance Objectives
ADV Committee
Complete SCO
VE Adminis-tration
Monitor Effectiveness (COICC) Cost Analysis
Program Approval
Course Approval

TASK ANALYSIS PROCESS

PROCEDURES

IDENTIFICATION OF DOT CODES, TITLES, AND CRITICAL FACTORS WITH USOE CODES, TITLES AND DESCRIPTORS

PROCEDURE I

A. Select USOE program code, title, and descriptor

B. Record DOTs and critical factors on Analysis Worksheet

C. Analyze data recorded

DEVELOPMENT OF COMPETENCIES BASED ON DOT DEFINITIONS

PROCEDURE II

A. Record USOE program identifiers

B. Copy DOT definitions

C. Write competency statements

D. Consult Subject Matter Advisory Committee for review

E. Assign competency number

F. Record DOT identifiers

G. Establish commonalities within DOTs

ESTABLISHMENT OF COURSE CONTENT FRAMEWORK

PROCEDURE III

A. Record USOE program identifiers

B. Transfer competency statements

C. Establish course data

D. Assign learning level

E. Assign instructional time (clock hours)

DEVELOPMENT OF COURSE COMPETENCY OUTLINES

Procedure IV

A. Record USOE program identifiers

B. Develop Four-Step Teaching Method

C. Write performance objectives

D. Combine competency outlin that comprise a single course

E. Consult Subject Matter Advisory Committee for verification/validation

INSTRUCTIONS FOR DEVELOPING THE COURSE CURRICULUM OUTLINE USING A TASK ANALYSIS PROCESS

The Task Analysis process described in the user's manual was developed to serve two distinct functions: (1) a planning tool for new programs and (2) an evaluation tool for existing programs. The methodology was designed to be used by instructors, administrators and other organization/institution personnel responsible for vocational training at the secondary, postsecondary, and adult levels.

Recently the California Occupational Information Coordinating Committee Staff (COICC) developed a data collection instrument known as the Program/Course Inventory (PCI). When completed, the PCI forms define vocational education instructional programs in terms of the courses which comprise them and list their occupational objectives. This Task Analysis manual provides the methodology by which the goal of the PCI may be obtained, either by using the four-procedure method to plan a new program or to validate current content of existing program/courses.

The organization of the manual divides the process into four unique procedures, each requiring a separate form to be completed. Each procedure deals with a specific phase of the overall analysis process and should be followed according to the step-by-step instructions in order to obtain the best results. The following matrices indicate the expected outcome of each procedure depending on the purpose for which the process is being used.

Development of this process has been based upon the following publications: the Standard Terminology for Curriculum and Instruction in Local and State Systems, Handbook VI; the Dictionary of Occupational Titles (DOT) (4th Edition); the Standard Occupational Codes(SOC), the 1978 National Occupational Information Coordinating Committee Interim Crosswalk: and the California Occupational Information Coordinating Committee (formerly CMMIS) Cross-Code Index (4th Edition).

The instructions that follow are suggested step-by-step procedures for completing Forms I - IV. At times, explanations, brief definitions and appendix references have been inserted into the instructions for clarification. Please review the Appendices carefully to become familiar with terms and definitions before beginning to use these procedures.

ACTIVITIES	PROCEDURE I FORM I - OUTCOMES
ANNING A NEW PROGRAM	A USOE code, title, and descriptor that best identifies the training area based on variable factors unique to the geographical location and training site. A homogeneous group of occupational titles that come within a USOE program in which: a. workers perform their jobs in the same or similar types of occupations b. workers perform the same types of tasks in relation to data, people, things c. all occupations are in the same industry or one designated as "Any Industry" A consistency in USOE, DOT, IND., and SOC titles and descriptors An identified mid-range GED reasoning (R) skill level for meeting training requirements for entry-level employment An SVP training time needed to perform a job at the entry-level identified and recommended for secondary and postsecondary levels

PROCEDURE I FORM I

ACTIVITIES	OUTCOMES
EVALUATING AN EXISTING PROGRAM (Recorded on PCI)	Verification of the correct USOE code, title and descriptor for the training area based on the 1978 USOE changes and revisions (ITEM 3) Verification of correct occupational program outcomes assigned to the PCI (COLUMN 15) All programs should be updated to use 4th Edition DOT codes and titles. A conversion table from 3rd Edition to 4th Edition is available Verification of GED (Reasoning, Mathematics and Language) in relation to DOT codes and title (COLUMN 16) Verification of SVP in relation to DOT code and title (COLUMN 17)
EVALUATING AN EXISTING PROGRAM (Not Recorded on PCI)	A checklist for occupational codes and titles/occupational program outcomes

PROCEDURE II FORM II

ACTIVITIES	OUTCOMES
PLANNING A NEW PROGRAM	An exact job definition based on worker functions: a. worker action - what the worker actually does, expressed by action verbs b. machines, tools, equipment and/or work aids - devices used by workers to assist them in performing their jobs c. purpose of worker actions - what gets done d. materials, products, subject matter and/or services - worker uses or produces A complete inventory of all competencies needed to perform the jobs that come within the USOE program that a Subject Matter Advisory Committee can evaluate and validate based on their expertise in the field A validated Master List of competencies from which to draw when developing a competency-based course outline
EVALUATING AN EXISTING PROGRAM (Recorded on PCI)	
EVALUATING AN EXISTING PROGRAM (Not Recorded on PCI)	

PROCEDURE III FORM III

ACTIVITIES	OUTCOMES
PLANNING A NEW PROGRAM	A grouping of competencies common to a single course Assignment of a course title that reflects the commonalities of the competencies A course descriptor that accurately identifies the course content and can be used in the Master Course Directory Establishment of course identifiers: a. length b. sequence number c. learning level d. instructional time e. occupational objectives
EVALUATING AN EXISTING PROGRAM (Recorded on PCI)	Verification of correct course title (COLUMN 6) Verification of: a. course length (COLUMN 11) b. - c. - d. instructional time (COLUMN 8) e. occupational objectives (COLUMN 7)
EVALUATING AN EXISTING PROGRAM (Not Recorded on PCI)	

ACTIVITIES	OUTCOMES
PLANNING A NEW PROGRAM	A course competency outline: a. Four-Step Teaching Method 1. Introduction 2. Presentation 3. Application 4. Evaluation b. Activity Time 1. Estimated instructional time 2. Estimated learning time c. Learning Level 1. Recognition 2. Recall 3. Reorganization Course content for Subject Matter Advisory Committee to review

ACTIVITIES	TOTAL OUTCOMES
LANNING A NEW PROGRAM	Data for Standard Course Outline (SCO) Data for Program/Course Inventory (PCI) Greater utilization of: a. teacher expertise/evaluation b. unique equipment c. specialized facilities Supporting documents as justification for offering a course Data for articulation
VALUATING AN EXISTING PROGRAM (Recorded on PCI)	Update data Add, delete, and/or modify programs/courses

PROCEDURE ONE

ANALYSIS WORKSHEET: DOT SELECTION PROCESS

FORM I

USOE CODE: ⎣⎦

USOE TITLE: ____________

USOE DESCRIPTOR: ____________

DOT OGA: ____________

DOT OGA TITLE: ____________

IND CODE: ____________

IND TITLE: ____________

SOC CODE: ____________

SOC TITLE: ____________

DOT CODES										IND.	GED			SVP	PHYSICAL DEMANDS						WORKING CONDITIONS							SOC
OGA			WORKER FUNCTIONS			ALPHABETICAL ORDER					R	M	L		1	2	3	4	5	6	1	2	3	4	5	6	7	
1	2	3	4	5	6	7	8	9																				
Category	Division	Group	Data	People	Things				DOT TITLES:	Designation No.	Reasoning	Mathematics	Language	Training Time	Strength	Climb-Balance	Stoop-Crawl	Reach-Feel	Talk-Hear	See-Color	Inside-Outside	Cold	Heat	Wet-Humid	Noise-Vibration	Hazards	Fumes-Odor-Dust	4-Digit Designation

12/78

Page ___ of ___ USOE Code ⎣⎦

FORM I

ANALYSIS WORKSHEET: DOT SELECTION PROCESS

PROCEDURE I

IDENTIFICATION OF DOT CODES, TITLES, AND CRITICAL FACTORS WITH USOE PROGRAM CODES, TITLES, AND DESCRIPTORS

Form I was designated to consolidate all occupational information pertaining to a single USOE Code. The purpose of this consolidation is to analyze and screen the components into a relatively homogenous group of occupations for use in the development of course curriculum content.

STEP A - USOE Code, Title and Description[1]

The USOE is a classification system intended to assist local and State education agencies in identifying, classifying, and describing items of information about subject matter and curriculum activities. Seven major vocational-technical areas have been identified and coded as follows:

01 - Agricultural

04 - Distributive Education

07 - Health Occupations Education

09 - Home Economics

14 - Office Occupations

16 - Technical Education

17 - Trade and Industrial Occupations

A-1 Select a USOE program. Use the 1978 NOICC Interim Crosswalk Conversion table to obtain revised code number.

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[1] These may be found listed in the U.S. Office of Education, Standard Terminology for Curriculum and Instruction in Local and State School Systems. State Educational Records and Reports Series Handbook VI. Washington, 1969.

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A-2 Using the 1978 NOICC Interim Crosswalk, locate the applicable USOE code number with program descriptor.

A-3 Read the program descriptor carefully to determine if the content meets your needs. Before adding, modifying or deleting a program and/or course(s) that make up a program, consider the following factors:

*a. local labor market demand

b. geographical location

c. funding

d. facilities/equipment availability

*e. unique characteristics of the community or Standard Metropolitan Statistical Area (SMSA)

f. new and expanding technologies

g. decline of occupations due to outmoded skills

A-4 Enter the USOE code number, title, and descriptor in the spaces provided at the top of the Analysis Worksheet.

A-5 Number the page at the bottom of the form and enter the USOE code. (Additional forms will be needed for each subsequent USOE code and title.)

* Data pertaining to these factors is available through COICC

STEP B - DOT Codes, Titles, and Critical Factors

The Dictionary of Occupational Titles is an occupational classification system in which an occupation is identified by: (1) a definition describing the job a worker performs as expressed by task element statements; (2) a 9-digit identification code for a specific occupation which differentiates it from all others; and (3) an industry designation in which the occupation may be found.

Critical factors, as used in this process, are identified as:

DOT IND - Industry Designated Number - indicates industry(s) in which occupation is most commonly found;

GED - General Education Development - those aspects of formal and informal education which contribute to the worker's reasoning, mathematical and language skills;

SVP - Specific Vocational Preparation - the amount of time required to learn the techniques, acquire information, and develop the facility needed for average performance in a specific job-related situation.

PHYSICAL DEMANDS - the important physical activities required of a worker on the job.

WORKING CONDITIONS - the physical surroundings imposed by a specific job which will markedly affect the worker.

SOC - a coding system and nomenclature for identifying and classifying occupations.

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B-1 From the list of occupational titles listed below the USOE code number, enter onto Form I the 9-digit DOT code, DOT title, DOT IND., GED, SVP, and SOC code in the appropriate cells under each corresponding heading and repeat for each DOT code and title listed.

EXCEPTION: Entries for columns designated PHYSICAL DEMANDS and WORKING CONDITIONS may be omitted except when designing a program for Special Education purposes.

NOTE: Some USOE programs may contain a large number of occupational titles. If this occurs, use as many pages of Form I as needed. Record the USOE code and title on each sheet and number each consecutive page in the lower right-hand corner.

STEP C - Data Analysis

After the program has been selected (Step A) and the occupations associated with that program have been identified (Step B), an analysis of the DOT Code and Critical Factors pertaining to each occupational title becomes a screening process to insure that only occupations that share common characteristics are included in the development of a course outline.

C-1 DOT Occupational Group Arrangement (OGA)- 1st, 2nd, and 3rd digits

(a) The first step in the analysis process is to take a look at all DOT titles related to the USOE program.

(b) Select an applicable OGA from the DOT listings on pages xxxiv-xli (4th Edition) that are identified by the nature of work performed and appropriate for your planning purpose.

(c) Enter the DOT-OGA number and title in the spaces provided.

(d) Consider rejecting all others that are dissimilar.

NOTE: If more than one OGA appears to be applicable for developing a sequence of courses, develop an analysis worksheet for each OGA needed.

C-2 DOT Worker Functions - (Data, People, Things - 4th, 5th, and 6th digits)

Evaluate the worker function designations (Appendix D).

(a) The cluster of occupational titles that you have isolated may consist of a wide range of data (0-6), people (0-8), and things (0-7) relationships. Because of the diverse functions in each of these categories, it is recommended, when possible, to select occupational titles within a homogeneous group using identical worker function designations, such as, all .362. Consider rejecting all other worker function designations that are different. This is especially important when working with a large number of occupational titles.

NOTE: Alphabetical Order (7th, 8th, and 9th digits). These digits do not have a significant role in the analysis process but do become important in distinguishing identical DOT titles at the 6-digit level.

C-3 Industry Designation Number (IND)

The Industry Designation* indicates the type of economic activity with which the job is associated. These designations also serve to differentiate between two or more occupations with identical titles but different duties. As used in the *Dictionary of Occupational Titles*, the industry designation appears in parentheses immediately following the occupational base title and is an integral and inseparable part of any occupational title. (For further clarification see DOT p. xix)

(a) The industry designation for each DOT title in the cluster should be the same or very closely related. Consider rejecting all others; for example, DOTs which are found in industries where there is little labor market demand.

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* The Industry Designation appears as a DOT Industry code number on the 1978 NOICC Interim. These numbers can be converted to DOT Industry Titles by consulting the *Standard Occupational Classification Manual*, pages 356-360.

(b) Retain appropriate DOTs that are designated "Any Industry."

(See Industry Designation Appendix A, p. xix)

C-4 General Educational Development (GED Codes)

The basic concept of General Educational Development is that some amount of general education and/or life experience is necessary for the satisfactory performance of any given job. This amount varies according to the nature and complexity of the job. The basic GED is subdivided into three factors: reasoning development, mathematics development, and language development. A numbered chart defining the six levels of each of these GED factors can be found in the Cross-Code Index, Volume 1.

a. Consider the GED level for which training is being planned, and which is applicable to secondary, postsecondary, adult education, rehabilitation, CETA, etc.

b. For entry-level skills at the secondary level, consider rejecting DOTs with a higher reasoning (R) skill than four (4). (A rating of 4 is mid-range and roughly equivalent to the 9-10 grade level.)

c. For postsecondary and advanced training, GED's of a higher level should be considered.

C-5 Specific Vocational Preparation (SVP Codes)

The idea underlying Specific Vocational Preparation is that some amount of time is required to learn the techniques, acquire information, and develop the facility needed for average performance in a specific job-worker situation. It also involves any amount of practice time needed to apply the learning in order to reach a level of average performance. SVP is always measured by performance.

The amount of time needed for Specific Vocational Preparation is also an indicator of the complexity of a job. There are actually three factors which influence the assigning of SVP to a specific occupation. These factors have to do with different aspects of job complexity. They are:

1) learning the techniques of the job,
2) acquiring the necessary job knowledge, and
3) developing performance competency.

(Training Time Scale can be found in the Cross-Code Index, Volume 1, page 35)

a. Consider rejecting DOTs which have a code higher than five for secondary instruction. (Five (5) is a training period of six months to one year.)

b. Consider rejecting DOTs which have a code higher than six for community colleges. (Six (6) is a training period of 1-2 years.)

C-6 Standard Occupational Classification (SOC)

(a) Locate the SOC code number in the Standard Occupational Classification publication.

(b) Evaluate the descriptor content to determine if the occupational classification is correct for your planning purposes.

(c) Consider rejecting those codes that are not applicable.

(d) Enter the SOC code and title in the space provided.

PROCEDURE TWO

MASTER PROGRAM COMPETENCY LIST

FORM II

USOE CODE:

USOE TITLE:

DOT CODE:

DOT TITLE:

DOT SEQUENCE NO.

ADVISORY COMMITTEE SCALE

DOT/COMPETENCY MATRIX

DOT CODE AND TITLE

DOT DEFINITION: (Xerox and paste in this space)

GENERAL FUNCTIONS:

COMP#	COMPETENCY STATEMENT	REQUIRED	RECOMMENDED	OPTIONAL	1	2	3	4	5	6	7	8	9	10

EQUIPMENT, MACHINERY, TOOLS, JOB AIDS:

SPECIAL KNOWLEDGES/SKILLS:

FORM II

MASTER PROGRAM COMPETENCY LIST

PROCEDURE II

DEVELOPMENT OF COMPETENCIES BASED ON DOT DEFINITIONS

Form II has been designed to accomplish a number of steps and to avoid unnecessary duplication of entering data. The lists of competency statements, after Advisory Committee input, will become a "Master List" of competencies for developing course content. Competency statements reflect what a person actually does in the form of action verbs.

STEP A - Code Identifiers

A-1 Enter the USOE code and title from Form I in the space provided.

A-2 Record the first DOT code and title from Form I in the spaces provided and enter the numeral one (1) in the space provided for DOT SEQUENCE NO.

STEP B - DOT Job Definition

B-1 Locate the DOT code and title in the Dictionary of Occupational Titles. (See Appendix A p. xxvi)

NOTE: If additional DOTs are located and appear to be applicable, they can be added to the list on Form I and will be subject to the same analysis process.

B-2 Copy the DOT definition in the space provided at the top of Form II. (For the sake of expediency, Xerox and paste it in the appropriate space which has been provided for you.)

B-3 Underline each action verb in the definition. When the DOT definition states "May", these action verbs should also be included.

B-4 Optional Entries:

a. General Function(s): (space has been provided below DOT Definition)

It may be useful to write the general functions involved in the performance of a job, for example, 211.362, "receives and pays out money, keeps records." General functions of the job will be stated in the lead statement of the DOT definition. (See Appendix D p. 32.)

b. Special Aids:

It may be useful, but not necessary, to make a list of the tools, equipment, knowledge, etc., needed to perform competencies for each DOT title for use in preparation of Procedure IV. (Space has been provided at the bottom of the page.)

STEP C - Competency Statement

C-1 In the Competency Statement column, write a statement for each action verb that represents the competency needed to perform that particular task. The competency statement should include the action verb, what is acted upon and what tools, equipment, etc., (if any) are used or required to take that action.

NOTE: Use the DOT definition, when possible, as it may state the competency in its entirety, i.e., "enter deposits in depositor's passbook," or use the Cross-Code Index (3rd Edition), Volumn I, pages 105 through 130. Competency statements are listed under GED levels.

C-2 If additional spaces are needed, use as many Form II's as necessary. Identify each successive sheet with the USOE code and title and DOT code and title. Number each consecutive sheet at the bottom of the page to correspond to the DOT Sequence Number.

C-3 Repeat Steps A-C for each DOT code and title on Form I until all occupational titles have been recorded. The DOT SEQUENCE NUMBER will be assigned in consecutive order.

STEP D - Advisory Committee

Establishing a subject matter Advisory Committee is a State requirement for the 5-Year Plan and an essential element in the task analysis process. The expertise provided by the Advisory Committee serves to validate the accuracy and relavancy of course curriculum competencies when correlated to job tasks as they are actually performed. In this capacity the Advisory Committee will be asked to:

D-1 Validate and modify, when necessary, the competencies on the prepared lists by placing a check mark (✓) in the appropriate box in the columns headed:

REQUIRED: A competency essential for performing a given task and an integral part of the job

RECOMMENDED: A competency desirable to know and occasionally needed on the job but not essential to perform at the entry level.

OPTIONAL: A competency not necessary to perform at the entry level but one that could be taught (time permitting) to supplement a required or recommended competency.

NOTE: This validation tends to localize the occupations, making the competencies more relevant to the prevailing job market.

D-2 Delete any of the competencies that are obsolete or inappropriate for the program area indicated.

D-3 Using a new Form II, enter additional competency statements that have not previously appeared on the competency lists, checking the appropriate REQUIRED, RECOMMENDED, OPTIONAL blocks.

D-4 When possible, provide the following information:

a. Advice pertaining to new and emerging occupations in the field.

b. Obsolescence in occupations and related competencies.

Optional occupational titles used in industry that differ from the DOT titles.

NOTE: When organizing an Advisory Committee, members must be drawn exclusively from the field of study. To assist in locating industries from which to solicit committee members, a DOT Industry Designation Conversion table is being furnished. The Conversion table provides the DOT Industry Numbers in the left column as they are used in the Cross-Code Index.

STEP E - Assigning Competency Number

E-1 Consecutively number each validated competency, beginning with the first competency on the first DOT list (DOT Sequence No. 1) and continue through the entire stack of Form II's until all competencies have been numbered. This will also include any new Form II's completed by the Advisory Committee.

NOTE: No two competencies will have the same number.

STEP F - DOT/Competency Matrix Identifiers

F-1 In column 1 on the DOT/Competency Matrix record the first DOT title and code. (DOT SEQUENCE NO. 1)

F-2 Continue across the columns recording DOT titles and codes in DOT SEQUENCE NO. order.

F-3 Following the last DOT title and code, record the identifier "ADVISORY COMMITTEE."

F-4 Repeat the identifiers on each sheet of Form II used.

STEP G - Commonalities Within DOTs

The DOT definitions have provided an inventory of all competencies involved in the performance of those jobs. Similarity in terminology does exist among the competencies. This step of the procedure is designed to compare and consolidate competencies in terms of terminology to create an unduplicated Master List of Competencies.

G-1 Transfer the numbers assigned to the competencies for the first DOT in the stack (DOT SEQUENCE NO.) to the cells in column 1 of the DOT/COMPETENCY MATRIX.

G-2 Using the next DOT title (DOT SEQUENCE NO. 2), compare the competency statements with those already listed for the first DOT title.

G-3 If a competency in the 2nd DOT consists of the same or a similar task as the first DOT but differs in terminology, place that competency number in the second column opposite the competency in the first column to which it is similar.

G-4 For the remaining competencies of the second DOT, transfer the competency number to the appropriate cell under the second column of the DOT Competency Matrix in the same manner as G-1 above.

G-5 Continue the same procedure for the remaining DOT code/title columns, until the Master Competency list has been completed. (DOT SEQUENCE NOS. will correspond to column numbers.)

G-6 If the cells in the DOT/COMPETENCY MATRIX indicate a competency is represented in several DOTs, select the statement that best represents the competency and eliminate the others from the Master List.

NOTE: All of any of the competencies in the Master List may be used to develop course content. The final decision concerning content and level of instruction should be left up to the vocational administrator and/or subject matter instructor.

PROCEDURE THREE

FORM III

COURSE CONTENT BY COMPETENCY

USOE CODE: ___ USOE TITLE: ___

COURSE TITLE: ___

COURSE LENGTH ___ COURSE SEQUENCE NO: ___

COURSE DESCRIPTOR: ___

OCCUPATIONAL OBJECTIVE

☐ A. APPRENTICESHIP
☐ B. ADVANCED OCCUPATIONAL
☐ C. INTERMEDIATE OCCUPATIONAL
☐ D. BEGINNING OCCUPATIONAL

COMP#	COMPETENCY STATEMENT	ADVISORY COMMITTEE SCALE			TIME	LEVEL
		REQ	REC	OPT		
					TOTAL TIME	AVG LEARN LEVEL

LEARNING LEVEL		
1. RECOGNITION	2. RECALL	3. REORGANIZATION

LEARNING LEVEL SCALE		
1.0-1.7	1.8-2.1	2.2-3.0

REQ=REQUIRED
REC=RECOMMENDED
OPT=OPTIONAL

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FORM III

COURSE CONTENT BY COMPETENCY

PROCEDURE III

ESTABLISHMENT OF COURSE CONTENT FRAMEWORK

Form III was designed to group together from a master list those competencies needed to develop course content within a designated USOE program. This method is applicable for developing a single course or a sequence of courses. The form also provides the capability for estimating instructional time needed for each competency and the learning level that identifies a designated occupational objective.

STEP A - USOE Identifiers

A-1 Record USOE Code and title where indicated

STEP B - Competency Statements

B-1 From the master competency list, transfer all competency statements, competency numbers and advisory committee ratings that will be combined into a single course. Methods by which course content is selected varies from program to program and instructor to instructor, therefore no attempt is made to detail this step of the procedure. Knowledge of the subject matter, experience, and advisory committee expertise will be the best indicators for grouping competencies into core groups.

NOTE: The same competency may be used for more than one course, either at the same learning level or at a more difficult learning level, depending upon the occupational objective.

STEP C - Course Identifiers

C-1 Course Title: Assign a course title for the group of competencies selected and enter the title in the space provided. The course title should reflect the commonality of the competencies selected.

C-2 Course Length: Enter the length of course in the space provided. Course length will be indicated by clock hours.

C-3 Course Sequence No: Enter the position this course occupies in a sequence of courses based on learning level.

C-4 Course Descriptor: Develop a descriptor for the course which details the content of the course based on the core of competencies involved. The course descriptor should be the same as the one used in the Master Course Directory. Enter the descriptor in the space provided.

STEP D - Learning Level

Learning level refers to the minimal expected achievements by individual students for specific skills and knowledge:

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a. Level 1: Recognition/Remember Facts
This level is concerned with the student's ability to follow directions. The student has to remember facts.

b. Level 2: Recall
This level provides instruction to the depth that a student successfully remembers something which has been learned previously.

c. Level 3: Reorganization
This level denotes the process by which a student faced with a new problem or situation has the ability to recognize common factors and bring many sources and types of information to bear on the solution.

D-1 Evaluate each competency in terms of the three levels of learning indicated above.

D-2 Assign a level to each competency and enter that number (1, 2, or 3) in the column headed LEVEL.

D-3 Total all learning level numbers for the course and enter the average number in the space indicated AVERAGE LEARNING LEVEL. Below is a scale that equates the average learning level of the total course content to an occupational objective.

LEARNING LEVEL SCALE		OCCUPATIONAL OBJECTIVE
1.0 - 1.7	=	Beginning Occupational
1.8 - 2.1	=	Intermediate Occupational
2.2 - 3.0	=	Advanced Occupational
2.2 - 3.0	=	Apprenticeship

D-4 Indicate by a check mark (✓) in the appropriate box at the top of the page the occupational objective for which the course content is planned. There should be some correlation between occupational objective and course sequence number.

STEP E - Time (Estimated Instructional Time/Clock Hours)

E-1 Assign an estimated amount of instructional time needed to accomplish the teaching of each competency. The learning level and Advisory Committee Rating should provide some indication as to the amount of time needed. The total clock hours of instructional time should correlate to the course length indicated above. If a large discrepency exists between the two, it will be necessary to re-evaluate the competencies to determine if the scope involved is too broad/narrow, learning level is appropriate for the occupational objective, and/or the instructional time is realistic.

PROCEDURE FOUR

COURSE COMPETENCY OUTLINE

FORM IV

USOE CODE: ________

USOE TITLE: ________

COMPETENCY # ____ : ________

COURSE TITLE

UNIT # | SEGMENT #

STEP I INTRODUCTION/MOTIVATION ________

STEP II PRESENTATION Technical Knowledge	TIME	LEVEL
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

STEP III APPLICATION Student Activities	TIME	LEVEL
A		
B		
C		
D		
E		

STEP IV EVALUATION ________

PERFORMANCE OBJECTIVES ________

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FORM IV

COURSE COMPETENCY OUTLINE

PROCEDURE IV

DEVELOPMENT OF COURSE COMPETENCY OUTLINES

Form IV was designed to develop each competency statement within a course into an instructional outline following the Four-Step Teaching Method.

STEP A - Identifiers

A-1 Record USOE code and title where indicated.

A-2 Record course title, competency statement and number.

A separate Form IV will be developed for each competency within the designated course.

A-3 Assign a unit number where indicated.

A unit is a part of the instruction that focuses upon a central theme, such as the "respiratory system" or the "automotive braking system." A unit normally consists of several segments formed through subject matter analysis.

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A-4 Assign a segment number if needed and enter where indicated.

Instructional segments are major instructional divisions of a unit. Through an analysis of the unit of instruction segments of instruction are identified. Each segment is a bit of cohesive instructional activity and the total instructional segments within a unit of instruction provide for sequential and coordinated learning experiences.

Factors that determine the number of instructional segments in a unit are;

1. the overall goals of the course,
2. the relationship of this unit to the course and instructional level,
3. grade level of the students,
4. time allotted to the unit,
5. equipment, tools, and materials available,
6. ability of the students,
7. previous experience of the students,
8. judgment of the teacher,
9. sequence of the unit in the course, and
10. any special licensing examination requirements.

STEP B - Four-Step Teaching Method

B-1 Develop the elements of the Four-Step Teaching Method. (Appendix C)

These four steps are:

I. Motivation or introduction,

II. Presentation,

III. Application, and

IV. Evaluation.

In Step II the "TIME" column represents the estimated amount of instructional time required to perform each activity. This determination will be at the discretion of the instructor. In Step III the "TIME" column represents the estimated amount of learning time required for a student to apply the knowledge/skill of the activity.

The "level" column refers to the depth of instruction, i.e., the minimal expected achievements by individual students for specific skills and knowledge. (See Procedure III)

NOTE: For examples of how "Levels of Instruction" can be utilized refer to Appendix C.

STEP C - Performance Objectives (Appendix C)

C-1 Write a performance objective for the competency listed above.

Specific student performance objectives are derived from course goals, and the outcomes must be identified in behavioral terms.

Correctly written behavioral objectives are formulated to describe:

a. what the student will be able to do as a result of the instruction.

b. the conditions under which the task is to be performed, and

c. the criteria upon which at least the minimum achievement necessary for satisfactory performance is identified.

(For examples, see Appendix C.

STEP D - Course Curriculum Outlines

D-1 Assemble all Form IV's that comprise a single course.

D-2 Staple together, using Form III as a cover sheet. A complete course packet is now prepared and available for transfer to the Program Course Inventory (PCI).

5

STEP E - Verification/Validation

E-1 Consult the Subject Matter Advisory Committee and have the course content verified/validated for accuracy in relationship to actual on-the-job performance standards.

APPENDIX A

The Standard Course Outline

(SCO)

The Standard Course Outline (SCO) is an important link between the COICC Task Analysis Process (TAP) and the COICC Program Course Inventory (PCI).

The Task Analysis process provides the method for associating occupations with education through their lowest common denominator -the task. The course can be viewed as a series of instructional units which teach tasks which in turn become "part of an instructional program." The Program Course Inventory (PCI) is the instructional program in terms of courses and their occupational objectives.

Therefore, the Standard Course Outline becomes the cover sheet for TAP forms 1 - 4 and any other required State/L.E.A. documentation used to develop, maintain and update a single course or courses. All SCO's which comprise a program can then be combined and when completed transferred to the PCI. In addition, data pertaining to the program is readily available for review and evaluation.

STANDARD COURSE OUTLINE (SCO)

GENERAL INFORMATION

(ITEMS 1-6 FOR EDUCATIONAL INSTITUTION ONLY)

1 CDS. ______

2 DISTRICT ______

3 SCHOOL/COLLEGE ______

4 LOCAL LOCATOR CODE (OPT) ______

5 FOR DP USE ONLY (OPT) ______

6 COURSE MEETS STATE PLAN ☐

7 ☐ NEW ☐ CONTINUING ☐ PROPOSED

8 DELIVERER OF SERVICE

- ☐ A. SECONDARY SCHOOL
- ☐ B. COMMUNITY COLLEGE
- ☐ C. ADULT SCHOOL
- ☐ D. ROP/C
- ☐ E. PRIVATE
- ☐ F. CETA
- ☐ G. UNIV CA SYSTEM
- ☐ H. CA STATE SYSTEM
- ☐ I. CYA
- ☐ J. OTHER.

9 COURSE DESIGNATION FOR SPECIAL STUDENTS

- ☐ A. DISADVANTAGED
- ☐ B. HANDICAPPED
- ☐ C. LES/NES

SPECIFY: ______

______

10 EVIDENCE ON FILE OF NEED FOR THIS COURSE (ACTION/MINUTES/DATE)

A. STUDENT/COMMUNITY ______

B. ADVISORY COMMITTEE(S) ______

C. LABOR MARKET

☐ 1. LOCAL ANALYSIS ☐ 2. EDD ANALYSIS ☐ 3. BOTH (LOCAL EDD)

☐ 4. COIS DATA USED ☐ 5. SUPPLEMENTAL DATA USED

D. ESTIMATED ENROLLMENT PER SECTION

1. INITIALLY ______ 2. DEVELOPED ______

11 COURSE APPROVAL:

	SIGNATURE	DATE
A. INSTRUCTOR		
B. IMMEDIATE SUPERVISOR		
C. CURRICULUM COMMITTEE		
D. ADVISORY COMMITTEE		
E. MANAGER		
F. CHIEF SCHOOL ADMINISTRATOR		
G. DISTRICT MANAGER		
H. DISTRICT SUPT/CHANCELLOR		
I. BOARD		
J. FINAL COURSE APPROVAL		

12 COURSE REVIEW

	DATES	RECOMMENDATIONS
REVISION #1		
REVISION #2		
REVISION #3		
REVISION #4		
REVISION #5		

COURSE DESCRIPTORS

13 COURSE TITLE ____________________

____

14 COURSE DESCRIPTION ____________________

____

____

____

15 UNIQUE COURSE CODE ☐☐☐☐

16 CID(CLASSIFICATION OF INSTRUCTIONAL DISCIPLINES) ☐☐☐☐

17 DIST. COURSE NO. ☐☐☐☐☐☐☐

18 METHOD OF INSTRUCTION

☐ A. LECTURE
☐ B. LAB
☐ C. LECTURE-LAB
☐ D. COOR. INST. SYS.
☐ E. INDEPENDENT STUDY
☐ F. COMMUNITY CLASSRM.
☐ G. COOPERATIVE VOC. ED.
☐ H. FORUM SERIES
☐ I. LECTURE SERIES

19 CREDIT/UNITS REQ. ☐☐

20 GRADING SYSTEM

☐ A. CREDIT-GRADED
☐ B. NON-CREDIT -NONGRADED
☐ C. OTHER ____________________

____

21 COURSE LENGTH (CLOCK HOURS) ____________________

22 FREQUENCY OF OFFERING

☐ 1. SEMESTER
☐ 2. QUARTER

☐ A. FALL
☐ B. WINTER
☐ C. SPRING
☐ D. SUMMER
☐ E. SUMMER (INTERSESSION)
☐ F. WINTER (INTERSESSION)

23 TIME OF OFFERING

☐ A. AM
☐ B. PM
☐ C. EVENING
☐ D. WEEKDAYS
☐ E. SAT
☐ F. SUN

24 CERTIFICATE COURSE

☐ YES
☐ NO

25 TRAINING OBJECTIVE:

☐ A. APPRENTICESHIP
☐ B. ADVANCED OCCUPATIONAL
☐ C. INTERMEDIATE OCCUPATIONAL
☐ D. BEGINNING OCCUPATIONAL

26 OCCUPATIONAL OUTCOME

	DOT CODE	DOT TITLE
A.	☐☐☐☐☐☐☐☐☐	____________________
B.	☐☐☐☐☐☐☐☐☐	____________________
C.	☐☐☐☐☐☐☐☐☐	____________________

27 PROGRAM(S) UTILIZING COURSE

A. TITLE ____________________ USOE ☐☐☐☐☐☐☐☐☐☐
☐ 1. REQUIRED ☐ 2. REQ OPTIONAL ☐ 3. RECOMMENDED
B. TITLE ____________________ USOE ☐☐☐☐☐☐☐☐☐☐
☐ 1. REQUIRED ☐ 2. REQ OPTIONAL ☐ 3. RECOMMENDED
C. TITLE ____________________ USOE ☐☐☐☐☐☐☐☐☐☐
☐ 1. REQUIRED ☐ 2. REQ OPTIONAL ☐ 3. RECOMMENDED

28 ARTICULATION

A. UNIV OF CA SYSTEM ____________________
B. STATE UNIV/COLLEGE SYSTEM ____________________

____

C. PRIVATE UNIVERSITY/COLLEGE ____________________

____

D. COMMUNITY COLLEGE ____________________
E. ADULT SCHOOL(S) ____________________
F. ROP/ROC ____________________
G. SECONDARY SCHOOL ____________________

APPENDIX B

THE PROGRAM COURSE INVENTORY

It is suggested that the Program Course Inventory (PCI) and the Standard Course Outline (SCO) be utilized inconjunction with the Task Analysis Process with regards to program course design or modification.

The Program Course Inventory relates occupational course to USOE occupational training programs.

The Standard Course Outline (SCO) provides a standardized format which describes the total content and potential outcome of occupational training courses. Adoption of this form will allow for administrative articulation at the Federal/State/district/local levels.

PROGRAM/COURSE INVENTORY

PROGRAM INFORMATION

A CDS ____________ **B** USOE ____________

D CID ______ **E** DISTRICT ____________

F SCHOOL/COLLEGE ____________

H USOE PROGRAM TITLE ____________

I MIN COMPLETION REQ'MTS ____________ **J** MEETS STATE PLAN ☐

K PROGRAM LENGTH ____________ **L** NEW ☐ CONTINUING ☐ PROPOSED ☐

M LOCAL LOCATOR CODE (OPT) ____________

N FOR DATA PROCESSING USE ONLY (OPT) ____________

C DELIVERER OF SERVICES
- ☐ A. SECONDARY
- ☐ B. COMMUNITY COLLEGE
- ☐ C. ADULT SCHOOL
- ☐ D. ROP/ROC
- ☐ E. PRIVATE
- ☐ F. CETA

G PROGRAMS/STUDENT GOALS
- ☐ A. AA/AS DEGREE
- ☐ B. INITIAL OCCUPATION
- ☐ C. SKILL UPGRADING
- ☐ D. COLLEGE TRANSFER
- ☐ E. COLLEGE GENERAL ED
- ☐ F. CERTIFICATES
- ☐ G. HIGH SCHOOL DIPLOM
- ☐ H. ELEMENTARY DIPLOM
- ☐ I. LICENSE PREPARATIO
- ☐ J. PERSONAL DEVELOPM
- ☐ K. CAREER EXPLORATIO

COURSE INFORMATION

*TITLE/S LIMITED TO 18 CHARACTERS/SPACES

1	2	3	4	5	6*	7	8	9	10	11

COLUMN LEGEND

1 LINE NO.

2 UNIQUE COURSE CODES

3 CID—CLASSIFICATION OF INSTRUCTIONAL DISCIPLINES

4 DCN—DIST. COURSE NO.

5—MEETS STATE PLAN

IDENT. & TITLE

DATE ____________

7 OCCUPATIONAL OBJECTIVES
- A. APPRENTICESHIP
- B. ADVANCED OCCUPATIONAL
- C. INTERMEDIATE OCCUPATIONAL
- D. BEGINNING OCCUPATIONAL
- E. NON—OCCUPATIONAL

8 HOURS

9 CREDITS/UNITS REQ.

10 UTILIZATION
- A. REQUIRED
- B. REQUIRED OPTIONAL
- C. RECOMMENDED

11 FREQUENCY
- 1. FALL
- 2. SPRING
- 3. FALL & SPRING
- 4. SUMMER
- 5. FALL & SUMMER
- 6. SPRING & SUMMER
- 7. FALL, SPRING & SUMMER
- 8. FLEXIBLE
- A. WINTER
- B. FALL & WINTER
- C. WINTER & SPRING
- D. FALL, WINTER & SPRING
- E. WINTER & SUMMER
- F. FALL, WINTER, SUMMER
- H. WINTER, SPRING & SUMMER
- J. FALL, WINTER,

12 DESCRIPTION
- A. LECTURE
- B. LAB
- C. LECTURE-LAB
- D. COOR. INST. SYS.
- E. INDEPENDENT STU
- F. COMMUNITY CLAS
- H. COOPERATIVE VO
- J. FORUM SERIES
- K. LECTURE SERIES

13
- 1. AM
- 2. PM
- 3. AM/PM (ALL DAY)
- 4. EVENING
- 5. AM/EVENING
- 6. PM/EVENING

OCCUPATIONAL INFORMATION

A CDS

B USOE CODE

C DELIVERER OF SERVICES
☐ A. SECONDARY SCHOOL
☐ B. COMMUNITY COLLEGE
☐ C. ADULT SCHOOL
☐ D. ROP/ROC
☐ E. PRIVATE
☐ F. CETA

14	15	16	17
DOT CODE/S	OCCUPATIONAL PROGRAM OUTCOME OCCUPATIONAL TITLE/S	GED RML	SVP

APPENDIX C

Some Essential Characteristics of Vocational Education Programs

To be successful, a program of vocational education should have the following characteristics:

1. The program is directly related to employment opportunities
2. The content of the courses which comprise the program is based upon periodic analyses of the occupations for which the training is being given.
3. The courses for a specific occupation or related occupations (occupational clusters) are established and maintained with the advice and cooperation of the various occupational groups concerned.
4. The facilities and equipment used in instruction are comparable to those found in the particular occupation.
5. The conditions under which instruction is given duplicate, as nearly as possible, desirable and/or undesirable, conditions in the occupation itself and at the same time provide effective learning situations.
6. The length of the teaching periods and the total hours of instruction are determined by the requirements of the occupation and the needs of the students.
7. Training in a particular occupation or occupational area is carried to the point of developing marketable skills, abilities, understandings, work habits, and appreciations sufficient to enable the trainee to obtain and hold a job.

8. Classes are scheduled at hours and during seasons convenient to the enrollees.
9. Instruction is offered only to persons who want, need, and can profit from it occupationally.
10. The teachers are competent in the occupation for which they are giving instruction and possess adequate professional qualifications for teaching.
11. Vocational guidance, including effective follow-up of all students who finish or drop out of a course, is an integral and continuing part of the program.
12. Continuous research for course improvement is an integral part of the program.

COURSE OUTLINE

The Course Outline determines the tasks, procedures, experiments and related information which must be incorporated into the instructional process. When the selection of these items is complete and the teaching methods have been decided upon, then specific lesson Instructional Analysis Guides can be prepared. The process of deciding upon what should be included in the content of a course is called "Subject Matter Analysis." Systematic analysis provides the teacher with a structural framework for writing the course outline.

To begin, the teacher needs to decide upon the overall goals for the course. These goals are usually developed after careful consideration of the various subject matter elements and their relationship to what the student is to do with the knowledge or skill after it is mastered. Appendix A provides some helpful hints for writing course goals. During the goal writing process, the subject matter of the course is analyzed to determine the specific skills or knowledges required. Some common methods used to analyze subject matter are analysis: (1) by the teacher based upon past experiences, (2) with consultative assistance, (3) through advisory committee suggestions, or (4) a combination of these methods.

Whatever the analysis method is utilized, the process involves the identification and listing of the major components or topics of which the subject matter is composed. These major topics are called units. The units may be selected on the basis of the different types of equipment required, services rendered, basic operations, material or products worked on, or related theories. Once the units (skills and knowledges) have been determined, an outline for a course of instruction is developed.

The outline is arranged by units, which in turn are divided into smaller topics called segments. As this outline is developed, some of the factors to be considered are: (1) the background and capabilities of the potential student, (2) the available instructional facilities, and (3) the expected benefit from the instruction.

It will become evident early in the process of outline development that many units and/or segments cannot be included in the final instructional program. This is because there are time considerations, equipment requirements, and other factors which prohibit their inclusion.

It is recommended that during the analysis and outline stages the main topics or units are written on 3 x 5 cards. Then when appropriate, the subtopic or segments can be added to the card. Other information to be included on the card is the total instructional time required for the unit and each of its segments and the appropriate instructional level for each unit. The 3 x 5 card permits experimentation with the sequence of each unit on the final outline.

The sequence of the various units and their segments is critical. The sequence of presenting teaching material to students should always be from relatively simple or "easy" to the complex or difficult material.

Instructional levels, previously mentioned, refer to the level of proficiency expected of the student after each unit of instruction is presented. A three-level structure is described in Appendix c.

The following criteria should provide some further guidance for determining the course design and the scope and sequence of its subject matter:

1. The design of the course should facilitate and encourage the selection and development of all types of learning experiences essential for the achievement of the desired outcomes sought by the teacher.
2. From among all the learning experiences that might contribute significantly to the realization of educational goals and objectives, the course design should enable the teacher to develop those that are most meaningful to the particular group of pupils presently receiving the instruction.
3. The design should permit teachers to utilize sound principles of learning in selecting and guiding the development of learning activities in the class.
4. The design should enable teachers to adapt the experiences to the developmental needs, capacities, and maturity levels of students.
5. The design should encourage teachers to take account of the learning experiences which students have outside the class and relate those to activities carried on within it.
6. The design should provide a continuity in learning experiences so that the learning activities in which students are engaged at any one time build on and fully develop learnings gained from earlier experiences and lead on to further experiences of maximum worth.
7. The subject matter should be so designed that it will assist students in building into character, personality, and their stock of knowledge the basic democratic values that characterize our culture.

8. The design of the course should be realistic, feasible, and acceptable.

FOUR STEP INSTRUCTIONAL METHOD

METHODS

PURPOSES

STEP I INTRODUCTION

1. Ask questions
2. Give examples
3. Tell personal experiences
4. Relate to previous lessons
5. Indicate future needs

1. To prepare the mind of the learner by:
   a. Attracting attention
   b. Arousing curiosity
   c. Creating interest
   d. Stimulating desire to learn

STEP II PRESENTATION

1. Explain procedures, principles, concepts
2. Give demonstrations
3. Use visual aids
4. Use written instruction sheets
5. Develop discussions
6. Emphasize key points
7. Stress safety habits

1. To present new ideas
2. To give instructions

STEP III APPLICATION

1. Have learner perform the job
2. Supervise performance closely
3. Check and correct errors
4. Check key points and safety procedures
5. Have learner repeat if necessary

1. To have the learner apply what has been learned in Step II
2. To give the learner practice in application

STEP IV TEST

1. Test students' performance
2. Give oral tests
3. Administer written tests
4. Develop discussions

1. To determine the extent of the students' learning
2. To determine the efficiency of instruction

DEVELOPMENT OF THE UNIT INSTRUCTIONAL ANALYSIS GUIDE

After the course outline has been fully developed, the Unit Instructional Analysis Guide may be prepared. The Unit Instructional Analysis Guide is a further refinement of the Course Outline in that it details the instructional process for each unit listed in the course outline. It is a "package" which contains: (1) specific student performance objectives for each unit, (2) instructional resources, (3) student motivation strategy, and (4) other instructional aids.

A good unit follows the four steps of instruction. These four steps are: motivation or introduction, presentation, application and evaluation. The motivation or introduction step introduces new ideas and experiences to be taught. It is essential that this step be designed to focus the interest of the student on the lesson to be learned and to provide him with a motive and enthusiasm for learning. The presentation step imparts new knowledge or skills to the learner. This step must be related to known ideas and experiences. The application step affords the learner the opportunity to put to use the information prepared for the presentation in the previous step. The evaluation step helps the instructor to determine how well the student has learned.

Each segment of the unit when fully developed includes: (1) the student performance objectives, (2) the levels of instruction, (3) the key points and student feedback, and (4) the student activities and evaluation for the segment and unit.

STEPS FOR ORGANIZING THE UNIT INSTRUCTIONAL ANALYSIS GUIDE

I. Writing Student Performance Objectives

Performance objectives describe: (1) what the student will be able to do as a result of the instruction, (2) the conditions under which the task is to be performed, and (3) the minimum criteria for determining a satisfactory performance.

II. Planning the Motivation Step

A. The motivation step is easier to plan after the complete unit instructional analysis guide has been written. After considering the various teaching factors, the teacher can develop the motivation step so that it is more applicable to what will be taught.

B. In writing the motivation step, list the techniques which will arouse interest and prepare the student for the learning experience. Ideas that can be included:

   1. Relate to personal experiences (caution: not too many).
   2. Relate the lesson to previous lessons.
   3. State future use of the skills and information covered.
   4. Use exhibits and displays.
   5. Relate to known interests of the students.

II. Planning Key Points and Activities

A. Use a brief step-by-step outline style for skills development.

   1. Start statements with action words such as cut, measure, fasten, adjust, etc.

   2. Refer to available job or operation sheets and attach them to the instructional analysis guide.

- B. Use a topical outline form for technical instruction.
   1. Develop a foundation from which you can teach.
   2. Present concepts, principles and required information.
- C. Plan the teaching techniques you will use in presenting the material. Include such items as:
   1. Teaching aids to be used
   2. Drawings and terms to be written on the board
   3. Sample problems. Include the solutions in the instructional guide.

IV. Planning Feedback and Check-up Items

- A. List the activities which students are expected to carry out as a means of applying (doing, using, practicing) the skills and information covered in the presentation step of the instructional segment. Include such items as:
   1. Assignments
   2. Questions, question topics, and problems
   3. Projects
   4. Reports
   5. Experiments
   6. Jobs, operation, or procedures
- B. Develop techniques and methods to provide feedback that will indicate whether the students have learned what was presented in the instructional segment.

C. Indicate the teacher's part in supervising, checking, and correcting the above activities.

V. Plan the Evaluation Step

A. List the techniques to be used to evaluate the student's performance and knowledge.

B. Include performance tests and written or oral tests used in this step.

VI. Completing Instructional Segments Presentation and Application Steps

A. Develop the student performance objectives for each instructional segment.

B. Continue this procedure until all the instructional segments for a particular unit have been completed.

VII. Complete Additional Items of the Unit Instructional Analysis Guide

A. Listing of references by title and page number.

B. Listing of other instructional resources, i.e., speakers, films, etc.

C. Supplemental tests and instruction sheets should be attached when completing the instructional packages.

PERFORMANCE/BEHAVIORAL OBJECTIVES*

A problem that has existed for a long time in education has been that of formulating objectives which clearly define for the student and the teacher the goals of instruction. What makes the development of objectives even more difficult is the range of interpretations existing between educators, not to mention between educators and the lay public. How many times have you encountered course objectives like these?

> "The student will know how printing developed," or
> "The student will know how a sewing machine operates," or
> "The student will appreciate the aesthetic design of a building."

These objectives are so broad and general that no two people could agree as to what extent the student should achieve the objectives. Further, the student has no specific idea how or what to study in order to achieve these objectives.

To begin the development of useful objectives, the "ideal" graduates of the course are examined and their abilities are broken down into measurable behaviors. It is important to realize that these behaviors are accomplished according to degree, e.g., some tasks are performed with the skill of an artisan; others involve only a demonstration of an ability to perform.

These behaviors or performance objectives are then given at the beginning of the course to the student. When the students know what they will be capable of doing after they complete the course, they will have some guidelines as to what to concentrate on during the course. The objectives help them further by telling them the conditions under which they will be performing, and how well they must perform to be acceptable.

---

*The terms Performance and Behavioral Objectives are for the purposes of this explanation to be considered synonymous.

The development of behavioral objectives occurs as follows:

1. The outcomes must be identified in behavioral terms.
2. Behavioral objectives are formulated which describe what the student is to be able to do as a result of the instruction.
3. Conditions under which the task is to be performed are described.
4. Some criteria are identified that will suggest at least the minimum achievement necessary for satisfactory performance.

Correctly written behavioral objectives contain numbers 2, 3 and 4 from the above list. These objectives inform both the teacher and the student what will be expected in terms of abilities, conditions and standards. If the objectives are thorough and well-written, they can be handed to a student to immediately pursue whatever study is necessary to accomplish the objective, without the usual anxieties and frustrations that precede examination time. Furthermore, these objectives can be handed to either an educator or lay citizen with the resulting identification of the specific outcomes of the course. An observer may be capable of entering a class in progress and assessing the achievement of certain objectives within one class period.

There are times when, even though the teacher knows perfectly well the objective, he cannot put it in writing so that it conveys the thought. There are words that are open to many interpretations, and words that are open to fewer interpretations. The following list illustrates this comparison:

(list on next page)

"Many Interpretations"	"Few Interpretations"
to know	to write
to understand	to recite
to really appreciate	to identify
to fully realize	to differentiate
to grasp the significance of	to solve
to enjoy	to construct
to believe	to list
to have faith in	to compare

Behavioral objectives usually start out with, "The student will be able to ..." and then the task is described. Certain objectives require behaviors that demonstrate thinking while other require the performance of a computational or a manipulative task. If the student is to be able to recognize names of tools, for example, the objective would be stated:

1. The student will be able to recognize the names of tools from a prepared list.

A difficulty still exists here, since we do not specify what kind of list, whether it contains tools in addition to other names, and, finally, we do not specify whether he must recognize all tool names or some specified percent of the total to be considered satisfactory. An improved objective might look like this:

2. The student will be able to recognize at least 18 out of 20 names of tools which are included in a list of 40 items commonly found around the shop.

or,

3. Given a list of 40 items commonly found around the shop, the student will be able to recognize 18 out of 20 names of tools included in the list.

Although this is a very elementary objective, it serves to point out the descriptive nature of behavioral objectives. If this was your objective, you would know that you should concentrate on recognition, not recall from memory, or the specific use of the tool, or its care. You would also know that you would have to recognize at least 18 tool names, which means that you would not quit studying after being able to recognize only 10.

A few sample behavioral objectives are listed:

1. Given a television receiver with a defective power supply, the student will locate the trouble using standard measuring instruments (or those in your shop which you would specify) and suggest the remedy on a piece of paper.
2. Given a piece of two-inch aluminum bar stock six inches long, the student will use the __________ lathe and turn a 50% taper within .005 inch.
3. Given an operational Ford ignition distributor, the student will be able to install it on the shop Ford engine correctly and adjust its timing within one degree with the aid of a timing light.

The following chart is a "Quick Guide to Writing Performance/Behavioral Objectives" and should prove useful to any teacher who is faced with the task of writing Performance/Behavioral Objectives for his course.

ELEMENTS OF PERFORMANCE/BEHAVIORAL OBJECTIVES

CONDITIONS--

Without reference to outside materials ...

With the aid of a textbook ...

(CONDITIONS cont'd.)

With the aid of his class notes ...

Outside the classroom ...

Given the proper tools & measuring equipment & needed supplies ...

In a 10-minute period ...

With a supply of common tools & equipment ...

BEHAVIOR--

Answer, Apply, Appraise, Arrange, Assemble, Build, Calculate, Choose, Compare, Compose, Complete, Conduct, Construct, Contract, Convert, Correlate, Demonstrate, Describe, Design, Develop, Differentiate, Discriminate, Draw, Evaluate, Fix, Formulate, Identify, Interpret, List, Maintain, Make, Measure, Operate, Plan, Provide, Quantify, Read, Recite, Repair, Select, Shape, Sketch, Solve, Test, Troubleshoot, Use, Write, etc. ....

CRITERIA--

Perform with 85% accuracy ...

Identify 10 of the 12 principles ...

Analyze correctly to within 5% tolerance ... etc.

SOME SUGGESTED ACTION WORDS FOR USE IN WRITING GOALS & OBJECTIVES

Apply
Appraise
Arrange
Assess
Build
Calculate
Conduct
Convert
Coordinate
Correlate
Demonstrate
Describe
Discuss
Distribute
Draw
Evaluate
Formulate
Handle
Initiate
Interpret
Maintain
Make Plans For
Measure
Meet With
Operate
Organize
Participate
Plan
Prepare
Present
Propose
Promote
Provide
Publish
Represent
Schedule
Select
Serve
Set Up
Solve
Study
Supervise
Use
Visit
Write

LEVELS OF INSTRUCTION

"Levels of Instruction" refer to the depth of instruction, so that specific skills and knowledge are specified for minimal expected achievements by individual students. Various classification names for levels of instruction have been used by experts in the field of curriculum development. These classifications may be found in several references. However, it has been found by teachers that a three-level classification is adequate and appropriate to the majority of instructional activities in which their students are involved. These levels are determined by careful study of the tasks or activities determined by subject matter analysis, in terms of the degree of manipulative skill needed, the technical knowledge required, the frequency with which the student performs them, the hazards inherent to the specified tasks, and the extent to which specialization is required.

To attempt to teach all parts of a course to the highest level would be both unrealistic and too time-consuming, even if it were possible. An electronics technician must know something about the characteristics and kinds of solder (Level 1) and he must actually solder connections, using manufacturer's specifications (Level 2), but he does not need the transfer knowledge about solder that might be needed by a metallurgist or a research worker for a manufacturer of solders. On the other hand, his ability to analyze and trace circuits must be transferable to devices which he never has seen (Level 3).

Experience has shown that teachers are able to specify expected levels of instruction in their own fields. The mechanics of classification require simply writing 1, 2 or 3 after each objective statement and making a tally of each of the three numbers. The general structure of the course and the relative emphasis at each level are indicated through a simple numerical tabulation. If a course planned as related instruction for apprentices comes out 90 percent Level 2, or a skill course shows 80 percent Level 1, some replanning undoubtedly is necessary.

Each instructional activity is classified at the highest level to which it is to be taught. All students may not achieve this level, even though it is a desirable level for successful entry to an occupation. A careful estimate can be made by the instructor of the percentage of a class that can reasonably be expected to reach the designated level. This can be written as a percentage alongside the level designated. It provides a good basis for comparing planned achievement with actual achievement, when progress records have been compiled

Level 1: Recognition/Remember Facts

In the three-level structure, the first level (recognition) is concerned with the student's ability to follow directions. The student has to remember facts. Instruction is to such a depth that a student recognizes an item after his memory is jogged. It requires sufficient knowledge of relationships and associated principles needed to make information being taught meaningful in a job-like situation. The student should know sources from which he may obtain information, and must develop the ability to follow directions. Motor skills developed at this level should provide perceptual awareness through sensory stimulation and sensory cues that identify a relationship with specific motor activities.

Level 1, as in the case of the other two levels, is achieved through purposeful instructional activities. Level 1 sometimes can be reached by the student without actually applying the information through a practical situation.

Some examples of Level 1 instruction are: information about alloy materials used to make high speed drills, solvent characteristics for dry cleaners, and pharmaceutical ingredients of certain medicines. Students must know such information in a context broad enough to make it useful.

Level 2: Recall

This level provides instruction to the depth that a student successfully remembers something which has been learned previously. The student's ability is developed to the degree that he can interpret diagrams, drawings, blueprints, tables, information in manuals, etc. At this level the student develops abilities to translate mathematical or verbal material into symbolic statements, and vice versa. Motor skills that are required for the performance of a task are usually for limited duration. The motor activity is complemented by guided response. Some examples of Level 2 instruction would include the packing of automobile wheel bearings and making proper adjustments through the use of information in a manual; the selection of wire of proper size based on a given wire size table, so that an electrical installation meets code requirements; and the interpretation of a patient's chart entries by a nurse so that proper bedside care is administered.

Level 3: Reorganization

The top level in this classification system is Level 3. This level denotes the process by which a student faced with a new problem or situation has the ability to recognize common factors and bring many sources and types of information to bear on the solution. At this level, knowledge and skills are learned in sufficient breadth and depth for the student to transfer earlier learnings to a new set of circumstances. It may involve reflections on the consequences to be expected if an action is taken. Instruction should develop the student's ability to apply principles, concepts and theories to specific situations. Some tasks that the student learns will require the ability to analyze or to synthesize so that a problem or activity can be solved or performed. At this level refined motor skills are developed. These skills are complex motor activities whereby performance is efficiently and smoothly executed. The mental and physical qualities of the task are retained during the learning process. Level 3 provides a base for transfer of learning so that a student can perform productively with a minimum of additional teaching.

In summary, the three levels of instruction may be identified as follows:

Level 1: Recognition

As characterized by:

1. Remembering facts.
2. Recognizing items in response to prompts.
3. Matching items to establish relationships.
4. Classifying ideas and generalizations.
5. Following written and oral directions.
6. Demonstrating perceptual awareness in motor skill activity from cues.

Examples:

1. Identifying alloys used to make high speed drill bits.
2. Matching characteristics of dry cleaning agents with their names.

3. Classifying medicines according to pharmaceutical ingredients.
4. Selecting a complete set of tools needed to perform a given task.
5. Locating appropriate sources of information in order to perform a given task.

Level 2: Recall

As characterized by:

1. Recalling specific information.
2. Interpreting diagrams, drawings, blueprints, tables, symbols and graphs.
3. Translating mathematical symbols and verbal statements back and forth.
4. Performing motor skills of limited duration, but having durable qualities, complemented by guided response.

Examples:

1. Repacking and adjusting automobile front wheel bearings according to an instruction manual.
2. Selecting and installing the proper wire according to a specific wire size table in accordance with building code requirements.
3. Providing proper bedside care based upon interpretation of a patient's medical record chart.
4. Restating ideas obtained from written component operational descriptions.
5. Deriving universal or conditional mathematical sentences depicting proportional relationships.

Level 3: Reorganization

As characterized by:

1. Recognizing common factors that apply to a new problem or situation.
2. Transferring earlier learnings to the solution of new situations.
3. Ability to analyze and/or synthesize in order to maintain continual operation of an intricate system and its components.
4. Weighing the consequences resulting from any action taken.
5. Planning and performing all specified task-oriented manipulations.

Examples:

1. Designing a structural complex incorporating loads, codes and economic considerations.
2. Determining internal and external performance characteristics of a system and formulating an equivalent model.
3. Designing and manufacturing a mass production item that has parts that move.
4. Deducing that an emergency exists from the analysis of a given patient's medical record.
5. Identifying the quiescent parameters of an electronic "Black Box".

APPENDIX D

DEFINITION
OF
TERMS

DEFINITIONS

Code

(1) a distinguished reference number or symbol

(2) a statement of laws of a specific field

Competent

Possessed of or characterized by marked or sufficient aptitude, skill, strength or knowledge

Competence

The quality or state of being functionally adequate or of having sufficient knowledge, judgment, skill or strength (as for a particular duty) range of ability or capability

Component

An easily distinguished or logically separable element of any specified system

Course of Instruction

A comprehensive outline of organized subject matter, used as a guide in teaching a given subject, and implemented by objectives, instruction sheets, tests, audio-visual materials, bibliographics

Course outline

A framework of basic teaching content

Criteria

The evaluation of work performed based on work behavior which can be observed and measured objectively to find out how well the task is performed

Cross-Code Index

An occupational information manual in which three (3) occupational coding systems (a) DOT, (b) USOE, (c) IOM/census have been crossed-referenced

Curriculum

An organized group of courses or subjects required for graduation or the attainment of any other predetermined goal in a major field of study

Curriculum Planning

Those functions that determine the kinds of training and education that will be provided at each stage in the education process. Included are goals, objectives, student or trainee prerequistites, course content, performance and achievement goals.

Dictionary of Occupational Titles (DOT)

A classification system identifying jobs by the nature of work performed and the demands of such work activities on the workers. The DOT groups jobs into occupations based on their similarities and defines the structure and content of the occupation, using a 9-digit numerical coding system. The first 3-digits (OGA = occupational group arrangement) identify the particular occupational group; the second 3-digits describe the levels at which the worker functions in the tasks performed; the final 3-digits include the alphabetical order of titles within the 6-digit code groups.

Element

This is the smallest step into which it is practical to sub-divide any work activity without analyzing separate motions, movements and mental processes involved

Job

This is a group of positions which are identical with respect to their major or significant tasks and sufficiently alike to justify their being covered by a single analysis

Job Analysis

The process of listing in correct order the operations, steps and key points that must be known and performed to do the job

Open Entry/Open Exit

A particular approach to operating a training facility usually characterized by admissive policies permitting a student to enter training with a minimum of qualifications and exit a program at various levels of job-capable skills

Position

A collection of tasks constituting the total work assignment of a single worker. There are as many positions as there are workers in the County.

Primary Skills

The basic skills required of a worker to perform the task at a satisfactory level

Entry Level Occupation

Job or occupation for which employers hire workers either with little or no previous work experience or with relatively minimum training or education. Occupations which require a greater amount of education or training have specific entry level classifications such as apprenticeship or internship.

General Education Development (G.E.D.)

Those aspects of education (formal and informal) which contribute to the workers (a) reasoning development and ability to follow instructions, and (b) acquisition of "tool" knowledges, such as language and mathematical skills. It is education of a general nature which does not have a recognized, fairly specific occupational objective. Ordinarily, such education is obtained in elementary school, high school or college. It also derives from experience and individual study. General Education Development here is a job analysis concept, and not related to the General Education Development testing for high school equivalency sponsored by the American Council on Education.

Industry Occupation Matrix

A cross-tabulation of data showing employment by both occupation and industry. The matrix forms a grid which can be used either vertically or horizontally and displays the distribution of occupations within industry categories. It may also be used as a base for calculating occupational projections within industry. The matrices in current use are mostly based on data derived from labor force tables in the United States Census.

Process

A series of actions or operations conducing to an end

Secondary Skill

Comprehensive basic skills, or additional skills which enhance the basic skill to improve work performance

Segment

A subdivision of a unit

Standard Metropolitan Statistical Area (SMSA)

An integrated economic and social unit containing either one city of 50,000 or more inhabitants, or two cities having contiguous boundaries and constituting a community with a combined population of at least 50,000 (the smaller city must have a populaton of at least 14,000). An SMSA includes the entire county of a central city and entire adjacent counties that are found to be metropolitan in character and economically and socially integrated with the county of the central city.

Student Performance Objective

Objectives that are written to describe student performance for the test step. The objectives include the job, the conditions under which the job is performed and the minimum performance standards acceptable.

Specific Vocational Preparation (SVP)

The amount of time required to learn the techniques, acquire information and develop the facility needed for average performance in a specific job-related situation

Task

One or more elements which constitute logical and necessary steps in the performance of work by the worker. A task is created whenever human effort, physical or mental is exerted to accomplish a specific purpose.

Training (Voc-Ed)

A planned and systematic sequence of instruction under competent supervision designed to impart predetermined skills, knowledge or abilities with respect to designated occupation objectives

Unit

A major division of a course outline consisting of a group of segments, all of which have at least one factor in common

USOE Classifications

The codes and definitions for instructional programs which provide a uniform basis for collecting, recording, interpreting and transmitting meaningful data about enrollments, graduates, placement and other significant items at the local, State and National levels. The USOE classifications also provide a standardized means of analyzing variations in curriculum content.

Working Conditons

The physical surroundings imposed by a specific job such as heat, cold, wet, dark, etc., which will markedly affect the worker

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COICC

California Occupational Information
Coordinating Committee

VOCATIONAL EDUCATION STANDARD COURSE OUTLINE

SCO

explanation and instruction manual

December 1978

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PREFACE

The Standard Course Outline (SCO) is based upon several local, State and Federally mandated forms which are presently in use through out many California school systems. This form developed by the California Occupational Information Coordinating Committee (COICC) provides users with a standardized method of consolidating required information on one form for administrative purposes. The SCO is designed to be used by all primary deliverers of both vocational and general education. Whenever possible, Program/Course Inventory (PCI) data elements and definitions are used and incorporated on the SCO form.

INTRODUCTION

The Standard Course Outline (SCO) is an important link between the COICC Task Analysis Process (TAP) and the COICC Program/Course Inventory (PCI).

Let's take a closer look at each of the three:

1. TASK ANALYSIS PROCESS

TAP is designed to analyze occupations according to the tasks performed. It is very important to insure that courses designed to meet vocational objectives teach the correct tasks. The TAP provides a method for associating occupations with education through their "lowest common denominator" - the task.

Each course (which can now be viewed as a series of instructional units which teach tasks) becomes a part of an instructional program. These programs are defined as a course or series of courses with a recognized vocational objective. This program is fully defined using the PCI.

2. PROGRAM/COURSE INVENTORY

The Program/Course Inventory (PCI) is a data collection instrument and was developed to collect data of uniform quality, in a standard format, timely, accurate, and pertinent to the subject. The completed PCI's define vocational education instructional programs in terms of the courses of which they are comprised and their occupational objectives.

3. STANDARD COURSE OUTLINE

The Standard Course Outline (SCO) conveniently becomes the cover sheet for TAP forms I - IV and any other documentation (i.e., State course approval, needs assessment, etc.) used to develop, maintain, and update a single course. All SCO's which comprise a program can then be combined and the essential organization is complete and ready for transfer to the PCI. In addition, all necessary data pertaining to the program is available in a tidy package when needed for review and evaluation.

USES FOR THE SCO

1. PROGRAM/COURSE APPROVAL

Every school/college district has some group, (i.e., curriculum committee, administrative councils, boards of education), which approves courses and programs. Utilizing the SCO in this approval process enables these decision-makers to see the relationship of the program to specific occupational objectives and other technical aspects such as instructional time, facility utilization, special building requirements for handicapped students, etc.

Secondary schools, ROP/C's, adult schools, and community colleges are subject to several approval processes before beginning actual delivery of a program and the courses that comprise it. The process starts with the application for approval of New Educational Programs (Form CC-EP-1). There are a number of similarities in this form and the SCO; therefore, the SCO will help facilitate the completion of this form.

2. PROGRAM ARTICULATION

The SCO can be used by school districts to assist them in preparing required articulation agreements. Because of its design and associated definitions, the SCO enables secondary vocational education directors, community college deans, ROP/C directors and adult education principals to analyze course content. This process will improve the students' ability to progress through programs offered by various participating institutions without being required to repeat certain competencies.

3. JUSTIFICATION OF COURSE/PROGRAM OPERATION

The SCO is useful to vocational education program administrators are faced with the problems of justifying the operation of a particular course. Such factors as instructional time required to offer the course, complexity of subject matter, related occupations, and numerous other administrative details are displayed on the SCO. These different information elements are critical to those who must justify course/program continuation.

INSTRUCTIONS FOR COMPLETING THE STANDARD
COURSE OUTLINE FORM (SCO)

The instructions that follow are a suggested step-by-step procedure for completing the Standard Course Outline (SCO) Form. As users become familiar with the form, they may wish to make modifications to meet the needs of their Local Education Agency (LEA). Definitions have been incor-porated into the instructions for clarification.

SIDE ONE

GENERAL INFORMATION:

(Items 1 - 6 are to be completed by educational institutions only.)

1. CDS CODE (COUNTY/DISTRICT/SCHOOL)

Enter the appropriate 14 digit CDS code. CDS codes can be obtained from the California Schools Directory, 1978.

2. DISTRICT NAME

Enter the name of the district in which the course is physically located.

3. SCHOOL/COLLEGE

Enter the name of the school/college at which the course is physically located. If the course is conducted off-campus, ie., community classrooms, mobile units, etc., this space may be utilized to enter the name of the physical site location.

4. LOCAL LOCATOR CODE (OPTIONAL)

To further identify off-campus sites, it is suggested that this space be utilized to record the geographical location by census tract identifiers should it become necessary. Census tract identifiers and codes are available from county/local planning departments or from the COICC Socio-Economic Reports.

5. DATA PROCESSING IDENTIFICATION CODE (OPTIONAL)

An optional item to be used by data processing centers which have assigned unique school identification codes other than the State assigned CDS codes. a maximum of eight positions have been allocated for this purpose.

6. COURSE MEETS STATE PLAN

Indicate with an "X" whether or not this course meets the California State Plan for Vocational Education, 1977 and the policies/procedures issued by the State Department of Education and the Chancellor's Office of the California Community Colleges.

7. NEW/CONTINUING/PROPOSED COURSE

Enter in the appropriate box an "X" indicating if the course is new, continuing, or proposed.

8. DELIVERER OF SERVICE

Place an "X" in the box which designates the type of institution which will operate the course and receives funds for the course via State appointment, student fees, or C.E.T.A.

Note: *When any of the following situations occur within a public school, two boxes should be marked with an "X".*

1. *When a public school offers a course as a result of contracting with a private agency.*
2. *When a private school operates a course thrcuth* CETA *funding.*

A. SECONDARY SCHOOL

A school comprising any span of grades beginning with the next grade following an elementary or middle school and ending with or below grade twelve (12).

B. COMMUNITY COLLEGE

A two-year community-based postsecondary institution which has authority to award an associate degree, a diploma and/or certificate of completion, and which offers comprehensive educational services to the community, and may include: occupationally oriented programs, general education, preparation for transfer to a baccalaureate degree program at a four-year institution, continuing adult education, basic developmental education, and community services.

C. ADULT SCHOOL

A separetly organized school providing instruction for persons beyond the age of compulsory school attendance.

D. REGIONAL OCCUPATIONAL PROGRAM/REGIONAL OCCUPATIONAL CENTER (ROP/ROC)

Regional Occupational Program (ROP) is an occupational training program which meets specific requirements and standards of instruction. The training activity is conducted in a variety of physical facilities and not situated in a single location or site.

An ROP shall provide occupational instruction related to the attainment of skills and knowledge so that the students are prepared for:

1) gainful employment in the occupational area for which training was provided
2) occupational upgrading so that the students will have the higher skill levels required by new and changing technology and employment practices.
3) preparation for enrollment in more advanced training programs.

Note: Regional Occupational Center (ROC) differs from an ROP by location or site. ROC is a single location or site set aside for providing the vocational/occupational training programs of a school district.

E. PRIVATE INSTITUTION (UNIVERSITY/COLLEGE)

An independent institution of higher learning offering courses of general studies leading to a Bachelor's degree and various postgraduate degrees.

F. COMPREHENSIVE EMPLOYMENT AND TRAINING ACT, 1973 (CETA)

Education delivered under the mandate of Comprehensive Employment and Training Act, 1973, and amendments, the purpose of which is to provode training and employment opportunities for economically disadvantaged persons, unemployed or underemployed persons which will result in an increase in their earned income, and to assure that training and other services lead to maximum employment opportunities and enhance self-sufficiency by establishing a flexible, coordinated, and decentralized system of Federal, State and local programs.

G. UNIVERSITY OF CALIFORNIA SYSTEM

A California based institution of higher learning providing facilities for teaching and research, and authorized to grant academic degrees: specially one made up of an undergraduate division which confers Bachelor's degrees, a graduate division which comprises a graduate school and professional schools each of which may confer postgraduate degrees.

H. CALIFORNIA STATE SYSTEM (UNIVERSITY/COLLEGE)

A California subsidized institution of higher learning offering courses of general studies leading to a Bachelor's degree and postgraduate degrees.

I. CALIFORNIA YOUTH AUTHORITY (CYA)

Programs providing vocational training services to people assigned by the court to an institution such as a prison, juvenile hall, detention facility or work camp.

J. OTHER

Other pertains to those agencies which offer vocational euducation by a means other than those institutions or educational agencies listed in the above.

9. COURSE DESIGNATION FOR SPECIAL STUDENTS

Indicate with an "X" the classification that best defines "Special Student" for the purposes of program and site design. The choices have been reduced to general categories, therefore, please write in specific handicap and/or disadvantage category. Definitions have been provided for some categories of disability not mentioned in the general definition. For legal definitions, refer to Handbook VI.

A. DISADVANTAGED

Persons (other than physically or mentally handicapped) who: (1) have academic or economic disadvantages; (2) require special services, assistance or programs in order to enable them to succeed in vocational education programs or in the work world.

1. Academic Disadvantaged
   A person who; (1) lacks reading and writing skills; (2) lacks mathematical skills; or (3) performs below grade level.

2. Economic Disadvantaged
   A person who is a member of a family which: (1) receives cash welfare payment; or (2) has a total annual income for the twelve months prior to application, in relation to family size, that does not exceed the poverty level determined in accordance with criteria established by the Office of Management and Budget.

3. Economic Disadvantaged for Education

Those who are not succeeding or cannot succeed in a regular vocational education program because of one of the following problems:

   a. geographic isolation
   b. need for economic assistance to enter or stay in school
   c. umemployed or underemployed
   d. family income is below poverty level

Special emphasis is on those persons from economically depressed areas.

B. HANDICAPPED

Persons who are mentally retarded; hard of hearing; deaf; speech impaired; visually handicapped; legally blind; severely emotionally disturbed; crippled by lack or loss of use of limb or other part of the body; have other health impairment; and by reason thereof, require special education, training, job conditions and equipment, or other services to enable them to succeed in a regular vocational program or on a job.

1. Learning Disabled Handicap

Persons identified as having sharp deficiencies in one or several aspects of the cognitive processes (i.e., sensory, associative and expressive) and showing marked underachievement when considering the general level or mode of their overall abilities.

2. Communication Handicap

Language usage which deviates from that of the school setting to the extent that it interferes with communication. Such deviation may occur in the reception as well as production and meaningful use of speech sounds, vocabulary and word order.

C. LIMITED ENGLISH SPEAKING PERSONS (LES)/NON-ENGLISH SPEAKING PERSONS (NES)

1. Limited English Speaking Persons (LES)

Individuals who come from environments where a language other than English is dominant and, by reason thereof,

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have difficulty speaking and/or understanding instructions in the English language. They may or may not have been born in the United States, but their native language is a language other than English.

2. Non-English Speaking (NES)
Individuals who come from environments where a language other than English is dominant and, by reason thereof, cannot speak and/or understand instructions in the English language.

10. EVIDENCE ON FILE OF NEED FOR THIS COURSE (ACTION/MINUTES/DATES)

A. STUDENT/COMMUNITY

Enter the appropriate rationale for student or community demand for this course, i.e., documentation for justification of offering course, such as needs assessment, etc.

B. ADVISORY COMMITTEE

Enter the committee's assessment for this course.

C. LABOR MARKET ANALYSIS

Place an "X" in the appropriate box or boxes which delineate the source data for your conclusions.

D. ESTIMATED ENROLLMENT PER SECTION

1. Initial Enrollment Estimation

Enter the estimated "initial" enrollment per section for this course.

2. Developed Enrollment Estimation

Enter the "developed" estimation of enrollment per section for this course.

11. COURSE APPROVAL (SIGNATURE AND DATE)

For items A - J, provide signatures, where applicable, and dates.

12. COURSE REVIEW DATES AND RECOMMENDATIONS

Enter the date course has been reviewed with recommendations regarding any changes.

SIDE TWO

COURSE DESCRIPTORS

13. COURSE TITLE

Enter the name of the course which is being offered, if applicable, include the number which identifies the course numerically.

14. COURSE DESCRIPTION

Enter the course description from TAP form III. This is the same description which should appear in the District Master Course Director.

15. UNIQUE COURSE CODE

Identify the course by a unique four-digit code. It is suggested that this unique code be numeric but it must be limited to a four (4) digit position. For example:

0181	Drafting	(First Year)
0182	Drafting	(Second Year)
0183	Drafting	(Third Year)

16. CLASSIFICATION OF INSTRUCTIONAL DISCIPLINES (CID) (COMMUNITY COLLEGE USE ONLY)

Enter the CID code associated with the course.

Note: A CID code reflects the program intent and course content of the majority of courses making up the total program. Under the Chancellor's Office program approval process, the course will carry the discipline code under which it was submitted.

17. DISTRICT COURSE NUMBER (IF APPLICABLE)

Enter the district course code which has been assigned to the course for which the SCO is being prepared. District course codes are used by school/college districts to identify their courses for scheduling and other purposes and are usually found in the District Master Course Directory.

18. METHOD OF INSTRUCTION

Indicate the type of instructional method being employed by entering one of the following codes:

A. Lecture

An activity in which the teacher gives an oral presentation of facts or principles, the class frequently being responsible for note taking. This activity usually involves little or no pupil participation by questioning or discussion.

B. Lab

Learning activities provided to pupils in a laboratory designed for individual or group study of a particular subject matter area, involving the practical application of theory through observation, experimentation, and research, or, in the case of foreign language instruction, involving learning through demonstration, drill, and practice. May also apply to the study of art and music, though such activity may be referred to as a studio experience.

C. Lecture/Lab

A combination of learning/instructional activities which may be in a laboratory setting during which the instructor intersperses oral presentations of materials at frequent and appropriate intervals with the pupil's participation or demonstration activities.

D. Coordinate Instruction System (CIS)

A system in which a variety of technical methods including the use of mechanical and electronic devices, self-instructional materials, and other similar teaching techniques may be used. (Title Five of the California Administrative Code, 55301)

E. Independent Study

Independent study is an activity in which pupils, carrying on their studies without attending formal classes, consult periodically with one or more staff members for direction and assistance, and frequently work toward the completion of individual study projects.

F. Community Classroom

A community classroom is a site or a series of physical locations away from a school site in which occupational training programs are conducted. A community classroom has as its general purpose the expansion of occupational training opportunities by the use of existing sites and facilities other than those in the public schools. A private postsecondary school under contract with a public school agency to provide occupational training, pursuant to Education Code Section 33133, shall not be considered a community classroom.

G. Cooperative Vocational Education

A combination program of vocational study and practice for persons through written cooperative arrangements between school and employer. The program offers instruction, including required academic courses and related vocational preparation, by alternating study in school and supervised on-the-job training.

H. Forum Series

A forum series course is an adult class which provides for discussion of public affairs under qualified leadership.

I. Lecture Series

A lecture series course is an adult class concerned with regulated subjects of educational value excluding those in public affairs. (Title Five of the California Administrative Code, 58160-62.)

19. CREDIT/UNITS REQUIRED

Enter the required number of units or credits to be granted upon satisfactorily completing the course

20. GRADING SYSTEM

Indicate type of grading system by placing an "X" in the appropriate box.

A. Credit - Graded

The unit value awarded for the successful completion of certain courses usually designated by an alpha letter (A, B, C, D).

B. Non-Credit - Non-Graded

A course for which pupils do not receive a grade or unit credit applicable toward graduation or completion of a program of studies.

C. Credit - Other

The unit of value awarded for the successful completion of certain courses which are intended to indicate the quantity of course instruction in relation to the total requirements for a diploma, certificate or degree.

21. COURSE LENGTH (CLOCK HOURS)

Indicate, by clock hours, total amount of instructional time assigned to this course.

22. FREQUENCY OF OFFERING

Indicate the course frequency by marking with an "X" one numerical code and one alpha code:

1. Semester
2. Quarter
A. Fall
B. Winter
C. Spring
D. Summer
E. Summer (intersession)
F. Winter (intersession)

23. TIME OF OFFERING

Indicate the time the course is being offered by marking with an "X" one (if applicable) or two of the following codes:

A. A.M.
B. P.M.
C. Evening
D. Weekdays
E. Saturday
F. Sunday

24. CERTIFICATED COURSE

Place an "X" in the appropriate box if the course will confer a certificate upon completion.

25. TRAINING OBJECTIVE

Indicate with an "X" the appropriate box which identifies the training objective of the course within the program structure.

26. OCCUPATIONAL OUTCOME

The expected occupational outcome of training and other preparation in the occupational objective and usually is stated in terms of a specific occupational title. Enter the occupational objective for this course.

27. PROGRAM(S) UTILIZING COURSE

Assign the appropriate USOE Code and Title of the training program(s) utilizing this course. The following designations are needed to identify course significance in relationship to the total program and its occupational objectives, however, this assignment cannot be made until the full content of the program is evaluated.

Required	course contains necessary content to gain skills needed to successfully perform on the job.
Required Optional	to acquire either general knowledge or additional occupational preparation.
Recommended	to acquire either general knowledge or additional occupational preparation.

28. ARTICULATION

Educational course articulation is a systematic process that enables a student to pursue a short-term or long-range educational, occupational or career preparation goals without duplication of courses or levels of competency. This coordination can take place within a single educational establishment, among two or more institutions of a similar level, sometimes referred to as "lateral" articulation, or two or more institutions of different levels sometimes called "vertical" articulation.

Enter the appropriate institution offering vocational education articulation. Refer to Institution Information, Deliverer of Service (Item 8), for the educational institution definitions.

APPENDIX 7

TASK ANALYSIS PROCESS

APPENDIX 6

VOCATIONAL EDUCATION OPERATIONS ANALYSIS PROCESS

Workshop Materials

Workshop Participants and Evaluations

Consultants Review

WORKSHOP MATERIALS

Attendance Sheet

Workshop Title ____________________

Date __________ **Location** ____________________

Name	Affiliation	Address
1 Phone		
2 Phone		
3 Phone		
4 Phone		
5 Phone		
6 Phone		
7 Phone		
8 Phone		
9 Phone		
10 Phone		
11 Phone		
12 Phone		
13 Phone		
14 Phone		

COICC
California Occupational Information
Coordinating Committee

VOCATIONAL EDUCATION
OPERATIONS ANALYSIS PROCESS

Workshop Agenda

I. Registration	
II. Introduction/Background - Introductions - Rationale for the "Vocational Education Operations Analysis"	Roland Boldt, Administrator, Field Operations, State Department of Education
III. Data: Its Collection and Use	John Van Zant COICC Director
IV. Situation Exercise	
V. "The Vocational Education Operations Analysis" - Defining Programs with the Program/Course Inventory (PCI) - Step-by-step instructions for completing the "Vocational Education Analysis Worksheet" -- Definitions -- Formulas	Dr. Art Smith, Director, Vocational Education/ROP San Bernardino County
VI. Simulation	Gail Robinson COICC Researcher
VII. Interpreting Results	
VIII. Dissemination	
IX. Evaluation	

KEY TERMS AND CONCEPTS TO UNDERSTANDING THE "VOCATIONAL EDUCATION OPERATIONS ANSLYSIS PROCESS"

VOCATIONAL EDUCATION PROGRAM: A planned sequence of classes, services, or other educational activities designed to prepare individuals for employment in a specific occupation or cluster of closely related occupations (NCES).

PROGRAM COSTS: Expenditures necessary to operate a vocational instructional program/service at the local school and/or district level.

STUDENTS SERVED: The official entrance of a student into a vocational education program at the level at which a vocational objective can be stated or implied (NCES).

COMPLETION: Those students who have finished a planned sequence of courses, services, or activities designed to meet a vocational objective which purports to teach entry-level job skills (NCES)

and

anyone who has been enrolled in and attended a program of vocational education and leaves the program or institution without completing the program, including persons who leave the program volutarily before its formal completion because they have acquired sufficient entry-level occupational preparation to work in the field (NCES definition of a leaver with skills).

PLACEMENTS: Those individuals who are identifiable by name as program completers, and, by a subsequent follow-up procedure, are also identifiable as workers in those occupations for which the program was designed, or are continuing advanced training for the same occupational field of study.

EFFECTIVENESS: A measure of the extent to which an objective is achieved. Program effectiveness is the relationship between planned objectives and the actual degree of attainment.

$$\text{Effectiveness} = \frac{\text{Acutal}}{\text{Planned}}$$

UNIT COSTS: The resources consumed for a unit of output

$$\text{Unit Cost} = \frac{\text{Total Program Cost}}{\text{Unit(s) of Output}}$$

--Unit cost(s): Cost per student served, cost per completion, cost per placement.

--Unit(s) of Output: Number of students served, number of completions, number of placements.

EFFICIENCY INDEX: A measure of the cost per student served compared to the planned cost per student served

$$\text{Efficiency Index} = \frac{\text{Actual Cost per Student Served}}{\text{Planned Cost per Student Served}}$$

PERFORMANCE RATIO: A precise index representing both program effectiveness and cost efficiency together.

$$\text{Performance Ratio} = \frac{\text{Average Program Effectiveness}}{\text{Cost Efficiency}} \times 100$$

COST-EFFECTIVENESS RATIO: A measure of the degree of goal attainment against cost.

$$\text{Cost Effectiveness} = \frac{\text{Average Program Effectiveness}}{\text{Actual Cost per Student Served}}$$

To be cost effective means to maximize the attainment of all planned objectives while at the same time minimizing costs.

PROGRAM A

SCHOOL YEAR: 1976-77
PROGRAM LENGTH: 315 HOURS
LOCATION: ABC HIGH SCHOOL

PLANNED PERFORMANCE

Estimated Number of Students to be Served:	61	Estimated Completions:	45	Estimated Placements:	20
Male:	11	Male:	5	Male:	2
Female:	50	Female:	40	Female	18
Handicapped:	7	Handicapped:	4	Handicapped:	3
Disadvantaged:	8	Disadvantaged:	7	Disadvantaged:	7
Displaced Homemakers:	3	Displaced Homemakers:	2	Displaced Homemakers:	1

PROPOSED BUDGET

	Amount Budgeted
A. Direct Program Costs	
1000 Certificated Salaries	$13,578
2000 Classified Salaries	-0-
3000 Employee Benefits	2,371
4000 Books and Supplies	2,600
5000 Contracted Services and Other Operating Expenses	1,600
TOTAL DIRECT COSTS	$20,149
B. Direct Support Program Costs	
School Administration	$ 400
Attendance and Welfare	300
Guidance and Counseling	600
Health	200
Maintenance	200
Operations	250
Transportation (Field Trips)	650
TOTAL DIRECT SUPPORT COSTS	$ 2,600
C. Indirect Support Program Costs	
General Support (Home-to-school Transportation)	$ 8,727
Instructional Support	375
TOTAL INDIRECT SUPPORT COSTS	$ 9,102
TOTAL PROGRAM BUDGET	$31,851

PROGRAM A SCHOOL YEAR: 1976-77

ACTUAL PERFORMANCE

Students Served:	59	Completions:	47	Placements:	19
Male:	10	Male:	7	Male:	2
Female:	49	Female:	40	Female:	17
Handicapped:	8	Handicapped:	5	Handicapped:	3
Disadvantaged:	7	Disadvantaged:	7	Disadvantaged:	6
Displaced Homemakers:	4	Displaced Homemakers:	3	Displaced Homemakers:	1

PROGRAM EXPENDITURES

	Amount Budgeted
A. Direct Program Costs	
1000 Certificated Salaries	$13,878
2000 Classified Salaries	-0-
3000 Employee Benefits	2,371
4000 Books and Supplies	2,813
5000 Contracted Supplies and Other Operating Expenses	1,300
TOTAL DIRECT COSTS	$20,362
B. Direct Support Program Costs	
School Administration	$ 400
Attendance and Welfare	300
Guidance and Counseling	600
Health	200
Maintenance	200
Operations	250
Transportation (Field Trips)	251
TOTAL DIRECT SUPPORT COSTS	$ 2,201
C. Indirect Support Program Costs	
General Support (Home-to-school Transportation)	$ 8,780
Instructional Support	375
TOTAL INDIRECT SUPPORT COSTS	$ 9,155
TOTAL PROGRAM BUDGET	$31,718

PROGRAM: A

SCHOOL YEAR: 1975-76
PROGRAM LENGTH: 315 HOURS
LOCATION: ABC HIGH SCHOOL

PLANNED PERFORMANCE

Estimated Number of Students to be Served:	59	Estimated Completions:	45	Estimated Placements:	32
Male:	10	Male:	6	Male:	3
Female:	49	Female:	39	Female:	29
Handicapped:	6	Handicapped:	4	Handicapped:	3
Disadvantaged:	11	Disadvantaged:	8	Disadvantaged:	7
Displaced Homemakers:	3	Displaced Homemakers:	2	Displaced Homemakers:	1

PROPOSED BUDGET

		Amount Budgeted
A.	Direct Program Costs	
1000	Certificated Salaries	$ 12,943
2000	Classified Salaries	-0-
3000	Employee Benefits	2,199
4000	Books and Supplies	2,386
5000	Contracted Services and Other Operating Expenses	1,994
	TOTAL DIRECT COSTS	$ 19,522
B.	Direct Support Program Costs	
	School Administration	$ 400
	Attendance and Welfare	300
	Guidance and Counseling	600
	Health	200
	Maintenance	200
	Operations	250
	Transportation (Field Trips)	350
	TOTAL DIRECT SUPPORT COSTS	$ 2,300
C.	Indirect Support Program Costs	
	General Support (Home-to-school Transportation)	$ 8,955
	Instructional Support	300
	TOTAL INDIRECT SUPPORT COSTS	$ 9,255
	TOTAL PROGRAM BUDGET	$ 31,077

PROGRAM: A

SCHOOL YEAR: 1975-76

ACTUAL PERFORMANCE

Students Served:	61	**Completions:**	40	**Placements:**	20
Male:	11	Male:	5	Male:	2
Female:	50	Female:	35	Female:	18
Handicapped	7	Handicapped:	4	Handiapped:	3
Disadvantaged:	8	Disadvantaged:	7	Disadvantaged:	5
Displaced Homemakers:	3	Displaced Homemakers:	2	Displaced Homemakers:	1

PROGRAM EXPENDITURES

		Amount Budgeted
A.	Direct Program Costs	
1000	Certificated Salaries	$ 12,931
2000	Classified Salaries	-0-
3000	Employee Benefits	2,217
4000	Books and Supplies	2,541
5000	Contracted Services and Other Operating Expenses	1,555
	TOTAL DIRECT COSTS	$ 19,244
B.	Direct Support Program Costs	
	School Administration	$ 400
	Attendance and Welfare	300
	Guidance and Counseling	600
	Health	200
	Maintenance	200
	Operations	250
	Transportation (Field Trips)	500
	TOTAL DIRECT SUPPORT COSTS	$ 2,450
C.	Indirect Support Program Costs	
	General Support (Home-to-school Transportation)	$ 8,054
	Instructional Support	300
	TOTAL INDIRECT SUPPORT COSTS	$ 8,354
	TOTAL PROGRAM COSTS	$ 30,048

PROGRAM: A

SCHOOL YEAR: 1974-75
PROGRAM LENGTH: 315 Hours
LOCATION: ABC HIGH SCHOOL

PLANNED PERFORMANCE

Estimated Number of Students to be Served:	88	Estimated Completions:	77	Estimated Placements:	66
Male:	15	Male:	12	Male:	5
Female:	73	Female:	65	Female:	61
Handicapped:	10	Handicapped:	8	Handicapped:	6
Disadvantaged:	17	Disadvantaged:	15	Disadvantaged:	12
Displaced Homemakers:	5	Displaced Homemakers:	4	Displaced Homemakers:	3

PROPOSED BUDGET

	Amount Budgeted
A. Direct Program Costs	
1000 Certificated Salaries	$ 12,331
2000 Classified Salaries	-0-
3000 Employee Benefits	2,098
4000 Books and Supplies	3,157
5000 Contracted Services and Other Operating Expenses	2,891
TOTAL DIRECT COSTS	20,477
B. Direct Support Program Costs	
School Administration	$ 500
Attendance and Welfare	300
Guidance and Counseling	400
Health	250
Maintenance	300
Operations	300
Transportation (Field Trips)	450
TOTAL DIRECT SUPPORT COSTS	$ 2,500
C. Indirect Support Program Costs	
General Support (Home-to-school Transportation)	$ 10,195
Instructional Support	300
TOTAL INDIRECT SUPPORT COSTS	$ 10,495
TOTAL PROGRAM BUDGET	$ 33,472

PROGRAM: A

SCHOOL YEAR: 1974-75

ACTUAL PERFORMANCE

	Students Served: 59	Completions: 45	Placements: 32
Male:	10	6	3
Female:	49	39	29
Handicapped:	6	4	3
Disadvantaged:	11	8	7
Displaced Homemakers:	3	2	1

PROGRAM EXPENDITURES

		Amount Budgeted
A.	Direct Program Costs	
1000	Certificated Salaries	$ 12,521
2000	Classified Salaries	-0-
3000	Employee Benefits	2,164
4000	Books and Supplies	2,547
5000	Contracted Services and Other Operating Expenses	2,072
	TOTAL DIRECT COSTS	19,304
B.	Direct Support Program Costs	
	School Administration	$ 400
	Attendance and Welfare	300
	Guidance and Counseling	400
	Health	200
	Maintenance	200
	Operations	250
	Transportation (Field Trips)	282
	TOTAL DIRECT SUPPORT COSTS	$ 2,032
C.	Indirect Support Program Costs	
	General Support (Home-to-school Transportation)	$ 9,082
	Instructional Support	300
	TOTAL INDIRECT SUPPORT COSTS	$ 9,382
	TOTAL PROGRAM COSTS	$ 30,718

STUDENTS SERVED DATE: 1974-75 COMPLETIONS PLACEMENTS

	PLAN	ACTUAL	EFFECTIVENESS ACTUAL ÷ PLAN		PLAN	ACTUAL	EFFECTIVENESS ACTUAL ÷ PLAN		PLAN	ACTUAL	EFFECT ACTUA
HANDICAPPED	10	6	.60	HANDICAPPED	8	4	.50	HANDICAPPED	6	3	.
DISADVANTAGED	17	11	.65	DISADVANTAGED	15	8	.53	DISADVANTAGED	12	7	.
LIMITED ENGLISH SPEAKING				LIMITED ENGLISH SPEAKING				LIMITED ENGLISH SPEAKING			
Dis. Homemakers	5	3	.60	Dis. Homemakers	4	2	.50	Dis. Homemakers	3	1	.

COMPOSITE EFFECTIVENESS: 4.79 AVERAGE EFFECTIVENESS: 53%

STUDENTS SERVED DATE: 1975-76 COMPLETIONS PLACEMENTS

	PLAN	ACTUAL	EFFECTIVENESS ACTUAL ÷ PLAN		PLAN	ACTUAL	EFFECTIVENESS ACTUAL ÷ PLAN		PLAN	ACTUAL	EFFECTI ACTUAL
HANDICAPPED	6	7	1.17	HANDICAPPED	4	4	1.00	HANDICAPPED	3	3	1.0
DISADVANTAGED	11	8	.73	DISADVANTAGED	8	7	.88	DISADVANTAGED	7	5	.7
LIMITED ENGLISH SPEAKING				LIMITED ENGLISH SPEAKING				LIMITED ENGLISH SPEAKING			
Dis. Homemakers	3	3	1.00	Dis. Homemakers	2	2	1.00	Dis. Homemakers	1	1	1.0

COMPOSITE EFFECTIVENESS: 8.49 AVERAGE EFFECTIVENESS: 94%

STUDENTS SERVED DATE: 1976-77 COMPLETIONS PLACEMENTS

	PLAN	ACTUAL	EFFECTIVENESS ACTUAL ÷ PLAN		PLAN	ACTUAL	EFFECTIVENESS ACTUAL ÷ PLAN		PLAN	ACTUAL	EFFECTIV ACTUAL ÷
HANDICAPPED	7	8	1.14	HANDICAPPED	4	5	1.25	HANDICAPPED	3	3	1.00
DISADVANTAGED	8	7	.88	DISADVANTAGED	7	7	1.00	DISADVANTAGED	7	6	.86
LIMITED ENGLISH SPEAKING				LIMITED ENGLISH SPEAKING				LIMITED ENGLISH SPEAKING			
Dis. Homemakers	3	4	1.33	Dis. Homemakers	2	3	1.50	Dis. Homemakers	1	1	1.00

COMPOSITE EFFECTIVENESS: 9.96

PROGRAM/SERVICE LENGTH: 315 Hours PROGRAM/SERVICE LOCATION: ABC High School

		1 PLAN	2 ACTUAL	3 EFFECTIVENESS (COL. 2 ÷ COL.1)	4 PLANNED UNIT COST (A1 ÷ B1)	5 ACTUAL UNIT COST (A2 ÷ B2, C2, D2)	6 EFFICIENCY INDEX (COL. B-5 ÷ COL. 4)
A	COST	$ 33,472	$ 30,718	UNUSUAL EXPENDITURES:			
B	STUDENTS SERVED	TOTAL: 88	TOTAL: 59	.67	$ 380.36	$ 520.64	1.37
		M: 15 F: 73	M: 10 F: 49				
C	COMPLETIONS	TOTAL: 77	TOTAL: 45	.58		$ 682.62	
		M: 12 F: 65	M: 6 F: 39				
D	PLACEMENTS	TOTAL: 66	TOTAL: 32	.48		$ 959.94	
		M: 5 F: 61	M: 3 F: 29				
E	COMPOSITE EFFECTIVENESS			1.73		DATE: School Year 1974-75	
F	AVERAGE PROGRAM EFFECTIVENESS (E÷3)			.58			
G	PERFORMANCE RATIO [(F3 ÷ B6) x 100]			42 %	NOTE: PLUS OR MINUS VARIANCES FROM 1.00 or 100% SHOULD BE VIEWED WITH EQUAL CONCERN.		
H	COST-EFFECTIVENESS RATIO (F3÷B5)			.0011			
A	COST	$ 31,077	$ 30,048	UNUSUAL EXPENDITURES:			
B	STUDENTS SERVED	TOTAL: 59	TOTAL: 61	1.03	$ 526.73	$ 492.59	.94
		M: 10 F: 49	M: 11 F: 50				
C	COMPLETIONS	TOTAL: 45	TOTAL: 40	.89		$ 751.20	
		M: 6 F: 39	M: 5 F: 35				
D	PLACEMENTS	TOTAL: 32	TOTAL: 20	.63		$ 1,502.40	
		M: 3 F: 29	M: 2 F: 18				
E	COMPOSITE EFFECTIVENESS			2.55		DATE: School Year 1975-76	
F	AVERAGE PROGRAM EFFECTIVENESS (E÷3)			.85			
G	PERFORMANCE RATIO [(F3 ÷ B6) x 100]			90 %	NOTE: PLUS OR MINUS VARIANCES FROM 1.00 or 100% SHOULD BE VIEWED WITH EQUAL CONCERN.		
H	COST-EFFECTIVENESS RATIO (F3÷B5)			.0017			
A	COST	$ 31,851	$ 31,718	UNUSUAL EXPENDITURES:			
B	STUDENTS SERVED	TOTAL: 61	TOTAL: 59	.97	$ 522.15	$ 537.59	1.03
		M: 11 F: 50	M: 10 F: 49				
C	COMPLETIONS	TOTAL: 45	TOTAL: 47	1.04		$ 674.85	
		M: 5 F: 40	M: 7 F: 40				
D	PLACEMENTS	TOTAL: 20	TOTAL: 19	.95		$ 1,669.37	
		M: 2 F: 18	M: 2 F: 17				
E	COMPOSITE EFFECTIVENESS			2.96		DATE: School Year 1976-77	
F	AVERAGE PROGRAM EFFECTIVENESS (E÷3)			.99			
	PERFORMANCE RATIO [(F3 ÷ B6) x 100]			96 %	NOTE: PLUS OR MINUS VARIANCES FROM 1.00 or 100% SHOULD BE VIEWED WITH EQUAL CONCERN.		
	ST-EFFECTIVENESS RATIO (F3 ÷ B5)			.0018			

10/77
Slide 1

VOCATIONAL EDUCATION PROGRAM OPERATIONS ANALYSIS
WORKSHOP EVALUATION

Your input on these items will be most useful in improving the content and format of our product and workshop. Where quantative information is desired, a blank space has been provided. Where a numerical rating scale is provided, please respond by circling the appropriate number in the two categories.

1) Value of topic - Was the topic presented relevant for presentation at this workshop?

2) Effectiveness of Presentation - Did the presentor teach you enough to have mastery of the topic?

A. WORKSHOP CONTENT	Value of Topic				Effectiveness of Presentation			
	None	Little	Some	Great	Poor	Fair	Good	Excellent
1. Rationale for the "Vocational Education Operations Analysis Process"	1	2	3	4	1	2	3	4
2. Data: Its Collection and Use	1	2	3	4	1	2	3	4
3. Situation Exercise	1	2	3	4	1	2	3	4
4. Step-by-Step Instruction	1	2	3	4	1	2	3	4
5. Definitions	1	2	3	4	1	2	3	4
6. Formulas	1	2	3	4	1	2	3	4
7. Simulation	1	2	3	4	1	2	3	4
8. Interpretation	1	2	3	4	1	2	3	4

B. Topics in the workshop should have:

--more emphasis ______________________________

--less emphasis ______________________________

C. Topics not covered which should be given some attention: ____________

D. Audio/visual aids' effectiveness

Overhead transparencies:

more ______

less ______

same ______

Comments/suggestions ______________________________

E. General:

1. Is the worksheet format sufficient for easy usage and visual display of pertinent data? Yes ____ No ____

   If not, what should be added or deleted for improvement?

2. Do you perceive an immediate need in your agency for this process? Yes _____ No _____

If yes, in what way do you plan to use it? ____________________

____

____

If no, why not? ____

____

____

3. Do you feel that this workshop session was needed for orientation and dissemination of the "Vocational Education Operations Analysis Process"? Yes _____ No ______

4. Do you foresee any major problems in performing the Vocational Education Operations Analysis in your agency? Yes _____ No _____

If yes, what are they? ______________________________________

____

____

F. Suggestions/comments on the workshop: ____________________________

____

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G. Respondent's identity (optional)

____
Name Agency Address

WORKSHOP PARTICIPANTS AND EVALUATIONS

Attendance Sheet

Workshop Title VOC ED PROGRAM ANALYSIS WORKSHOP

Date ______________ Location ______________________________

Name	Affiliation	Address
1 Freemont Hobert	Riv. Co. Schools	
Phone Coordinator		
2 James I. Crandall	State Dept. of Ed.	
Phone Coordinator		
3 Larry Lloyd	Moorpark College	
Phone Assoc. Dean Voc. Ed.		
4 Jin Eun Kim	Indiana University	
Phone Asst. Prof. & Pro.Dir.		
5 Lee Arain	Baldy View ROP	
Phone Bus. Mgt.		
6 R. K. Eissler	State Dept. of Ed.	
Phone Coordinator		
7 A. Williams	State Dept. of Ed.	
Phone Consultant		
8 John W. Kramer	Victor Valley Jt. Union HS Dist.	
Phone Asst. Supt.		
9 Carole J. Perry	Victor Valley Jt. Union HS Dist	
Phone Accountant		
10 Larry Munz	S. B. Co. ROP	
Phone Coordinator		
11 Pat Langlin	State Dept.	
Phone Voc. Ed. Consultant		
12 Joan Soto	Chaffey H.S.	
Phone Business Dept.		
13 Roger Tucker	State Dept.	
Phone Voc. Ed. Consultant		
14 Dick Lano	State Dept.	
Phone Voc. Ed. Consultant		

COICC
California Occupational Information Coordinating Committee

Name	Affiliation	Address
15 Harold Fielding	Corona - Norco	
Phone		
16 Arnold Christen	Chaffey H.S.	
Phone		
17 Lois Mulvihill	Corona - Norco	
Phone		
18 Roland Boldt		
Phone		
19 ~~Mara Marken~~	~~Chaffey College~~	
Pl Admin Consultant		
20 Majorie Gardner	CCC	
Phone Specialist, College Senior		
21 John Van Zant	COICC	
Phone COICC Director		
22 Gail Robinson	COICC	
Phone		
23 Dennis Bean	COICC	
Phone Senior Planner		
24 Art Smith	S.B. County Schools	
Phone Director		
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VOCATIONAL EDUCATION PROGRAM OPERATIONS ANALYSIS
WORKSHOP EVALUATION

A. WORKSHOP CONTENT	VALUE OF TOPIC				EFFECTIVENESS OF PRESENTATION			
	None	Little	Some	Great	Poor	Fair	Good	Excellent
1. Rationale for the "Vocational Education Operations Analysis Process"	1	2	3	4	1	2	3	4
	(0)	(2)	(17)	(15)	(0)	(0)	(19)	(14)
2. Data: Its Collection and Use	1	2	3	4	1	2	3	4
	(0)	(1)	(13)	(18)	(0)	(1)	(15)	(16)
3. Situation Exercise	1	2	3	4	1	2	3	4
	(0)	(0)	(5)	(2)	(0)	(0)	(5)	(2)
4. Step-byStep Instruction	1	2	3	4	1	2	3	4
	(1)	(0)	(10)	(33)	(0)	(0)	(15)	(30)
5. Definitions	1	2	3	4	1	2	3	4
	(0)	(2)	(18)	(25)	(1)	(1)	(21)	(23)
6. Formulas	1	2	3	4	1	2	3	4
	(0)	(3)	(18)	(25)	(0)	(2)	(20)	(25)
7. Simulation	1	2	3	4	1	2	3	4
	(0)	(1)	(13)	(27)	(0)	(3)	(13)	(27)
8. Interpretation	1	2	3	4	1	2	3	4
	(1)	(1)	(20)	(23)	(0)	(7)	(19)	(19)

VOC ED PROGRAM ANALYSIS WORKSHOP
EVALUATION SUMMARY

1. This effort toward accountability must be recognized and I do sincerely appreciate it.

   Questions in my mind - not answered yet by me:

   1. Equal value placed on "enrollment", "completions" and "placements" do not hold water at the present time;
   2. One year (2nd) cost $395 to train one student, $552 third year and $682.62 first year - to much imbalance per student trained;
   3. "H" has to have more of a "meaning" in order to have the process justify the effort, it HAS TO STAND ALONE - yet compare

2. I'm concerned that the analysis system is over simplified.

   * I would probably want to include other factors in the analysis
   * Definition of goals is extremely important
   * I would like to have weights assigned to the various components (enrollments, completions, etc.)
   * Take difficulty of getting accurate placement data is a concern
   * I'm not secure with the usefulness of the cost-effectiveness indicator

   Positive future:

   * makes us take a good hard look at our costs
   * forces us to set goals and objectives
   * gives us a start for basing our decisions on hard data

   A good start. I'll be working with these ideas in the next couple of months. If I get any new insights I'll share them with you.

3. The in-service was very well planned and the information was made clear. It is obvious that much preparation and planning went into the activity.

   Districts could make good use of the information obtained through this process of measuring cost-effectiveness. The same system could be used even more so by colleges and university's in selecting and funding their curriculum.

The process itself is relatively simple and would not take an excessive amount of time.

HOWEVER

The process would become extremely difficult on programs which include many courses; especially when the enrollments vary and the students are enrolled for many different reasons.

For each measure that can be used for some kind of purpose, there are a half dozen non-related or in some cases, opposite measures which fall out of the formula.

RECOMMENDATION

The state use the formula to find excessive costs per placement as a guide to schools of courses which might be frowned upon.

OR

Rather than cost per placement, there might be recommended minimum percentages for placement.....i.e., no matter how cheap the cost - shouldn't enrollments be reduced if placements drop below a certain percentage?

4. Explanation of H Cost-Effective indicator not clear - what does it mean? I would be concerned with the additional work needed to complete the analysis - something is needed.

Placement at the secondary level is difficult to obtain. Follow-up surveys are returned mostly by one group and it is difficult to obtain a fine random sample with our present resources.

I like the idea of using data that for the most part is already available. I'm going to try and find the time to work out some actual programs based on last years claim.

5. I enjoyed the opportunity to participate. I think what you are working on is needed and you are really getting at the heart of it.

   Problems

   1. Definition of enrollment
      a. each individual on roll at any time
      b. a.d.a.
      c. peak enrollment
      d. set data - enrollments

   I don't know which, but must define

   2. Completers/leavers - clear distinction
   3. Performance Indicator - ongoing?
   4. Cost Effectiveness - I question its validity

6. Problems

   * Dividing percents by percents is a problem
   * Should use duplicated counts (Larry Lloyd)
   * Third year figures are deceiving. Your completions and placements Should have gave up 34% the same as enrollments
   * Why not have a cost-effectiveness for each - enrollment - placement - Completions instead of using the average of all three divided by enrollment
   * Duplicated count
   * Alternative enrollment data

7. Critique

   * Need explanation of various catagories
   * Which year was the best? How do we tell from data?
   * Mechanics are easy, interpretation is unclear
   * Actually, a basic requirement prior to a workshop is to read the manual fairly thoroughly
   * Application to ones own program will make data more meaningul

8. * Use as tool only
   * Replacement and capital outlay - can be direct, direct support
   * Duplicated enrollment; by eliminating one or two to one, will throw budget figures
   * February; date could be earlier in districts

B. Topics in the workshop should have:

- more emphasis:spin-off ideas which the data can manifest; use of data (interpretation of data); comparison of hard data from year to year dividing percentage comparisons; alternative uses; no opinion; interpretation of results, explanation of uses in evaluation programs; on worksheet; ranges of effectiveness or cost-efficiency and ratios to use in final measurements; background on development of model; on how to relate col's 5 B, C, and D to real life planning for programs; on PCI; on interpretation; each task area could have used more time during explanation before starting on the assignment; item to be included in in data base, the pros and cons of various units that could be used were a bit unclear and should be given more emphasis; interpretation; on community college application; acceptable methods of cost proration under VEA guidelines; on program versus program comparisons; Van Zant's original outlays and statement of data uniforming.

- less emphasis: on plan versus actuals; on planned versus placement; not sure that Col. 6 efficiency index is of much value as are lines G and H; simulations for only one; cost effectiveness ratio; use lecture to supplement book rather than read from manual; a little less on the pitch at the end telling how the data can be used.

C. Topics not covered which should be given some attention: instead of comparing planning to actual, more comparison of actual to actual; how VEOAP data related to data required by VOC ED reports; more analysis of actual costs, actual enrollments, completions, and placement from year to year or over 3 years; final reports to school boards, etc.; alternate methods of evaluation for example the vertical, actual, as a planning tool it was good; how the costs shown were calculated and where you can find that information readily; how to use manual in "cost-effectiveness" between Voc Education and regular district program.

D. Audio/visual aids' effectiveness

Overhead transparencies:

more 2

less 0

same 34

Comments/suggestions: well done, very clear; transparency of simulation results and then analyzing; should match examples in hand-outs; very informational; printing on your transparencies could be darker; good color, clarity; very good, easy to follow; good use; well assembled; use the same transparency on the answer sheet for the simulation.

E. General:

1. Is the worksheet format sufficient for easy usage and visual display of pertinent data: Yes 43 No 2

   If not, what should be added or deleted for improvement: compare actuals for cost/ADA, cost/student, cost/placement/sex equity.

2. Do you perceive an immediate need in your agency for this process Yes 24 No 16

   If yes, in what way do you plan to use it? probably won't because of time element, the need is there but the time isn't; primarily in selected program evaluation; to indicate that per pupil cost is not a valid measure for program cost effectiveness; in planning program, in determining effectiveness of program, modifies; will review existing data to see how it can be used; we are already doing something similar, may want to use some of the forms, compare notes; measurement of previous programs for use in planning; will be gradually implemented, will be slow due to cost and time; revealing areas needing further study; to compare the education to regular programs to show cost effectiveness in relation to regular classes; need to think about the whole process, we are in the middle of cutting 10% to 15% of our instructional programs, it may be useful in looking at the sacred cows in social science versus vocational courses; someone may be searching for a system; program planning due to reduction of financial support; compare one program at different school sites for prelimiary budget; will use the process in dealing with the ed. coordinators to appraise their planning and improve their performance; P/C inventory, I like format also will try analysis worksheet; comparative program analysis; program analysis and comparison; to determine possible cut backs if needed.

If no, why not? do not feel all the evaluations are relevant; small school, probably could for planning future programs; couldn't use it for decision making now, must make these decisions later; time consuming not productive; limited staff; other reasons are determining program development and continuation;

3. Do you feel that this workshop session was needed for orientation and dissemination of the "Vocational Education Operations Analysis Process"? Yes 41 No 2

4. Do you foresee any major problems in performing the Vocational Education Operations Analysis in your agency? Yes 18 No 21

If yes, what are they? doesn't presently meet our reporting requirements; extra work load; believe it will be difficult to get accurate data from LEAs; getting the data from our computer print outs for areas other than the VEA reports is difficult; time; administration consistency; accurate placement data; because of the nature of our project funding it will be difficult to implement; time involved to generate the necessary data and do the evaluations; time and staff; setting up valid data collection; administrative direction and input and clerical support; time and staff; question our data; not participating, too much evaluation and compliance now; limited staff; identification of program/students costs;

F. Suggestions/comments on the workshop: terminology should be consistant with any terms or interpretations that must be used in state reports; more needs extension revision with priorities - placement, cost/ADA, and cost/students; good, about right length any more is too heavy; reduce to half day; it was fine considering one of the key people was ill; excellent; well presented; would like to have had fiscal director involved in this workshop; excellent workshop; well done; suggest mailing interpretation of page 45 prior to workshop; good material, good presentation providing more information we may use to analyze our program; investigate a comparison of voc and non voc courses, field test and give interpretative examples, this would provide an effective tool/weapon to support VEA programs; think you should adhere to your announced times, if you decide to cut it short let the participants know it ahead of time, I came a long way and I won't make use of the workshop.

CONSULTANTS REVIEW

MEMORANDUM

TO: Gail Robinson
California Occupational
Information System

July 10, 1978

FROM: Larry Lloyd L.L.

SUBJECT: Cost Effectiveness of Program Plan

Following our recent meeting I have prepared an analysis of the cost effectiveness program and have divided my work into four parts. Two of those parts I am supplying to you with this memo. The other two should be in your hands by the end of the week. Included with this document are the following:

1. A copy of the plan itself, including the step-by-step analysis with hand written notations in the "recommendations for change" column so that editing and other contextual adjustments can be made if you agree with my notations.

2. A list of recommendations focused upon the basic concept of the cost effectiveness approach itself.

The other two items which I will be delivering to you later in the week are more substantive in nature than those listed above. I believe in order to fully bring the community college program within the scope of the cost effectiveness effort being made here it will be necessary to do the following two things:

1. Provide for a revised "vocational program analysis worksheet" reflecting an historical context and some of the additional complexity found in community college programs.

2. A plan for actually pilot testing a cost effectiveness model in a community college district. (The outline I will provide indicates how this could be done utilizing the Ventura County Community College District at least on a tentative basis.)

After you have had a chance to review my materials, please let me know if you have any questions.

meg

RECOMMENDATIONS REGARDING COST EFFECTIVENESS APPROACH OF THE CALIFORNIA OCCUPATIONAL INFORMATION SYSTEM PLAN

After reviewing the two documents entitled The Vocational Education Program Operation Analysis from the viewpoint of the community college administrator I have arrived at several general observations and, in some instances, recommendations for revision of approach. Below I have attempted to list those with as much detail as possible:

1. THE GOAL OF THE PROGRAM OPERATIONS ANALYSIS as being a helpful tool to vocational administrators is a very sound one; however, placing too much emphasis upon the completion of federally and state required reports is to draw a negative reason for carrying out the study. Rather the approach that should be used would be to more strongly emphasize the fact that local vocational administrators need to know more about the allocation of resources to their programs in order to do local planning. Only in this way can better selection of programs and carrying out of programs be accomplished. A side benefit of such a program will be to also provide basic information for federal and state reports.

2. Step six of the actual process for completing the program analysis worksheet utilizes the concept of counting only unduplicated identified vocational enrollments. This concept is in direct opposition to current cost effectiveness approaches by which revenue is assessed through the ADA process and for which Vocational Education Act claim form information is collected. It may very well be true that an NCES standard for a program enrollment in an unduplicated count; however, to do what is suggested in the outline would be to develop an extremely sophisticated system by first analyzing all duplicated enrollments and then, on an historical basis, probably through PESDS, identifying only those students who have reached a certain level of program involvement. At this point a very technical prorata system for sorting cost, again only on a multi-year basis and prorated, would have to be employed in order to subtract all costs of vocational education focused upon those students not meeting the requirements for vocational education identification within PESDS. The implications of such an approach are somewhat frightening from the standpoint of vast

reductions in numbers of students that would be counted and thereby the inferred reduction of funding to the local educational agencies as a result of what would be a far more accurate count. However, there is the philosophical objection to such a system which focuses itself upon whether or not students who have not technically committed themselves to vocational education are not indeed involved in the cost of vocational education at least from an exploratory point of view. Certainly from the standpoint of the community college this basic approach needs much more exploration because of the considerable number of "shoppers" that appear on our rolls prior to any final definition of vocational education objective.

3. As noted in the last comment, it is not possible to do accurate cost analysis unless a data base is set up on a multi-year level. To do any less is to have totally invalid information and to be unable to truly identify vocational enrollments at the community college. Therefore, the explanatory information must offer to the users a plan for implementing a data base on a multi-year level and for completing ongoing cost analyses that will in the long run become meaningful.

4. The basis for identifying placements needs stronger clarification. Certainly at the community college level a placement on a job is counted just as that. However, movement from the community college to the four-year institution or private institution in a related field also is counted as a placement. Related to all of this is the necessity to suggest how this particular program for vocational education can be applied more broadly to the academic programs of the college. Here we arrive at the political implications of cost effectiveness studies and in order for them to be successful at any institution will require their complete application rather than their use only in vocational education. For that reason a more extensive definition of placement must be arrived at so that all of the programs of a community college could be assessed through the use of the program analysis worksheet.

5. It is understandable why equipment, equipment replacement, and building construction (including site development) has been excluded from the program analysis worksheet. However, this again presents only a partial cost effectiveness study. Since I have already suggested that some type of multi-year approach be included in this plan, it would then follow that a prorating system could be instituted thereby these three areas could be incorporated into the cost overview. It might also be possible to flag certain programs as having extraordinary single or two-year cost levels based upon VEA guidelines encouraging new or expanded or improved programs. Again, to exclude such cost items is to render invalid a cost effectiveness study.

6. Not enough emphasis is placed upon the projection aspect for considering completions. I fully realize that this is not directly a responsibility of a cost effectiveness study but rather is part of the planning process that is reflected for vocational education through the CCOE-48. However, given the somewhat low level of planning for a large number of institutions, this very well may be an appropriate place to reemphasize the needs and the methodology to be utilized in projecting completions. Such an explanation could be directly tied to the outcomes of a cost analysis study.

7. For any manual on cost effectiveness to be used by community college administrators there must be considerable attention given to an explanation of how to treat program overlap. There is no problem any greater in need of solution and is the single item that will be the Achilles' heel of any such explanation. For example, in the business area a cost effectiveness study might be accomplished on the entire .14 category; however, unless there is a definitive recommendation for treating course overlap and, therefore, program overlap greater definition will not be possible, certainly not at the six-digit USOE level.

In spite of the seven notations above which sound some level of negativism, I would like to commend the COIS staff for launching itself into what is certainly the most controversial area of program review. Any degree of success in this area can only be extremely helpful in the long run toward allowing for better vocational planning. And beyond that is the concept of applying the same approach to all of education so a true context can be established rather than a "gut-level" planning concept. I will be available to expand on or explain more fully any of my comments.

moorpark college

office of instruction

August 8, 1978

Gail Robinson
California Occupational Information System
Ventura County Superintendents Office
County Office Building
Ventura, CA 93009

Dear Gail:

Attached you will find my most recent creation in development of cost accounting program model for program evaluation purposes. This has been developed based upon the community college needs and is a further extension of the comments I made to you in written form.

I have also included a copy of an actual program completed on the new form. At the present time this revised system is being analyzed by others in the Ventura County Community College District who are involved in budget development and analysis. It is my belief that seventy to eighty percent (70-80%) of the form provides sound analysis points; the remainder needs additional work through discussion and redevelopment.

I am now working on a step by step process for completing the form and an analysis of the value of certain key items. Those items are the following: 10, 12, 13, 15, 17, 19, 22, 25, 27, and 28.

At your convenience I will be glad to go over this with you. Of course, I will supply you with updated versions, the step by step process and the key point analysis when completed.

Sincerely,

Lawrence G. Lloyd

Lawrence G. Lloyd

/kn
cc: William Lawson

7075 campus road moorpark, california 93021 phone (805) 529-2321

reductions in numbers of students that would be counted and thereby the inferred reduction of funding to the local educational agencies as a result of what would be a far more accurate count. However, there is the philosophical objection to such a system which focuses itself upon whether or not students who have not technically committed themselves to vocational education are not indeed involved in the cost of vocational education at least from an exploratory point of view. Certainly from the standpoint of the community college this basic approach needs much more exploration because of the considerable number of "shoppers" that appear on our rolls prior to any final definition of vocational education objective.

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In spite of the seven notations above which sound some level of negativism, I would like to commend the COIS staff for launching itself into what is certainly the most controversial area of program review. Any degree of success in this area can only be extremely helpful in the long run toward allowing for better vocational planning. And beyond that is the concept of applying the same approach to all of education so a true context can be established rather than a "gut-level" planning concept. I will be available to expand on or explain more fully any of my comments.

Date: July 25, 1978

TO: Gail Robinson
California Occupational Information System

SUBJECT: REVISIONS TO COIS VOCATIONAL EDUCATION PROGRAM ANALYSIS WORKSHEET

In attempting to build in a more realistic approach to cost-effectiveness I am suggesting that the following ten (10) points be considered in a revision to the Vocational Education Analysis Worksheet:

1. Complete steps one (1) through five (5) as originally outlined.

2. Keep components of step six (6) regarding unduplicated count but add for "enrollment" only a program duplicated count.

3. Keep steps seven (7) and eight (8) content as is.

4. Add additional steps to flow from unduplicated enrollment to computation of A.D.A. for the program followed by computation of income "local and state" from the A.D.A. generated.

5. Add computation that relates "actual program costs" this income generated from A.D.A. by dividing income into actual cost. This will then serve as an indicator of high cost versus low cost programs from a strictly A.D.A. analysis and will also provide a valuable basis for comparision to education programs.

6. An additional method needs to be used to sort the total cost of operating a program to students, some of whom may have avocational or general educational goals as compared with those having more serious program aspirations. A comparing of unduplicated counts as compared by the SAM system divided by the unduplicated count would produce a percent (%) level of those involved in vocational goals as opposed to others. This factor will then be used as the level of actual costs to be divided by the unduplicated count in form items 4B, 5B, 5C, and 5D.

7. B6 will then be determined using the revised computations approach on B4 and B5.

8. Computations for columns 3B, C, D, E and F will stay the same.

9. Computation for G2 and H2 will now be determined using the new formula additions.

10. A computation of unit cost by A.D.A. should also be included by dividing the total A.D.A. generated into the actual program costs.

kn

VOCATIONAL EDUCATION PROGRAM ANALYSIS WORKSHEET

PROGRAM/SERVICE TITLE: Graphic Arts

USOE PROGRAM CODE: 171900

PROGRAM/SERVICE LENGTH: 2 yrs.

PROGRAM/SERVICE LOCATION: MC

		1 PLAN	2 ACTUAL	3 PROGRAM EFFECTIVENESS (COL.2÷COL.1x100)	4 PLANNED UNIT COST (A1÷B1)	5 ACTUAL UNIT COST (A2÷B2,C2,D2)	6 COST PERFORMANCE (COL.5÷COL.4 x100)
A	COST	$ 86,075	$ 58,409.77	DATE: 7 | 23 | 78			
B	ENROLLMENTS	M: 164 F: 62 TOTAL: 226	M: 115 F: 43 TOTAL: 158	70 %	$ 380.86	$ 369.68	97 %
C	COMPLETIONS	M: 16 F: 2 TOTAL: 8	M: 3 F: 1 TOTAL: 4	50 %		$ 14,602.44	
D	PLACEMENTS	M: 6 F: 2 TOTAL: 8	M: 1 F: 0 TOTAL: 1	13 %		$ 58,409.77	
E	COMPOSITE (SUMS)			133			
F	AVERAGE (E÷3)			44 %			
G	PERFORMANCE INDICATOR (F3÷B6x100)		45 %				
H	COST-EFFECTIVENESS INDICATOR (F3÷B5)		.119				
A	COST	$	$	DATE:			
B	ENROLLMENTS	M: F: TOTAL:	M: F: TOTAL:	%	$	$	%
C	COMPLETIONS	M: F: TOTAL:	M: F: TOTAL:	%		$	
D	PLACEMENTS	M: F: TOTAL:	M: F: TOTAL:	%		$	
E	COMPOSITE (SUMS)						
F	AVERAGE (E÷3)			%			
G	PERFORMANCE INDICATOR (F3÷B6x100)		%				
H	COST EFFECTIVENESS INDICATOR (F3÷B5)						
A	COST	$	$	DATE:			
B	ENROLLMENTS	M: F: TOTAL:	M: F: TOTAL:	%	$	$	%
C	COMPLETIONS	M: F: TOTAL:	M: F: TOTAL:	%		$	
D	PLACEMENTS	M: F: TOTAL:	M: F: TOTAL:	%		$	
E	COMPOSITE (SUMS)						
F	AVERAGE (E÷3)			%			
G	PERFORMANCE INDICATOR (F3÷B6x100)		%				

VOCATIONAL EDUCATION PROGRAM ANALYSIS WORKSHEET

ROGRAM/SERVICE TITLE: Landscape Horticulture

USOE PROGRAM CODE: 010509

ROGRAM/SERVICE LENGTH: 2 yrs.

PROGRAM/SERVICE LOCATION: MC

	1 PLAN	2 ACTUAL	3 PROGRAM EFFECTIVENESS (COL. 2÷COL. 1x100)	4 PLANNED UNIT COST (A1÷B1)	5 ACTUAL UNIT COST (A2÷B2, C2, D2)	6 COST PERFORMANCE (COL. 5÷COL. 4 x100)
COST	$ 74,238	$ 72,278.32	DATE: 7/23/78			
ENROLLMENTS	M: 341 F: 99 TOTAL: 440	M: 348 F: 103 TOTAL: 451	102%	$ 168.72	$ 160.26	95%
COMPLETIONS	M: 32 F: 9 TOTAL: 41	M: 7 F: 4 TOTAL: 11	27%		$ 6,570.76	
PLACEMENTS	M: 20 F: 3 TOTAL: 23	M: 5 F: 2 TOTAL: 7	30%		$ 10,325.47	
COMPOSITE (SUMS)			159			
AVERAGE (E÷3)			53%			
PERFORMANCE INDICATOR (F3÷B6x100)		56%				
COST-EFFECTIVENESS INDICATOR (F3÷B5)		.330				
COST	$	$	DATE:			
ENROLLMENTS	M: F: TOTAL:	M: F: TOTAL:	%	$	$	%
COMPLETIONS	M: F: TOTAL:	M: F: TOTAL:	%		$	
PLACEMENTS	M: F: TOTAL:	M: F: TOTAL:	%		$	
COMPOSITE (SUMS)						
AVERAGE (E÷3)			%			
PERFORMANCE INDICATOR (F3÷B6x100)		%				
COST EFFECTIVENESS INDICATOR (F3÷B5)						
COST	$	$	DATE:			
ENROLLMENTS	M: F: TOTAL:	M: F: TOTAL:	%	$	$	%
COMPLETIONS	M: F: TOTAL:	M: F: TOTAL:	%		$	
PLACEMENTS	M: F: TOTAL:	M: F: TOTAL:	%		$	
COMPOSITE (SUMS)						
AVERAGE (E÷3)			%			
PERFORMANCE INDICATOR (F3÷B6x100)		%				

VOCATIONAL EDUCATION PROGRAM ANALYSIS WORKSHEET

PROGRAM/SERVICE TITLE: Real Estate USOE PROGRAM CODE: 041700

PROGRAM/SERVICE LENGTH: 2 yrs. PROGRAM/SERVICE LOCATION: MC

		1	2	3	4	5	6
		PLAN	ACTUAL	PROGRAM EFFECTIVENESS (COL.2÷COL.1x100)	PLANNED UNIT COST (A1÷B1)	ACTUAL UNIT COST (A2÷B2, C2, D2)	COST PERFORMANCE (COL.5÷COL.4 x100)
A	COST	$ 103,224	$ 94,494.93	DATE: 7/23/78			
B	ENROLLMENTS	M: 1064 F: 298 TOTAL: 1362	M: 782 F: 260 TOTAL: 1042	77 %	$ 75.78	$ 90.69	119 %
C	COMPLETIONS	M: 57 F: 22 TOTAL: 79	M: 28 F: 6 TOTAL: 34	43 %		$ 2779.26	
D	PLACEMENTS	M: 35 F: 14 TOTAL: 49	M: 8 F: 3 TOTAL: 11	22 %		$ 8590.45	
E	COMPOSITE (SUMS)			142			
F	AVERAGE (E÷3)			47 %			
G	PERFORMANCE INDICATOR (F3÷B6x100)		39 %				
H	COST-EFFECTIVENESS INDICATOR (F3÷B5)		.518				
A	COST	$	$	DATE:			
B	ENROLLMENTS	M: F: TOTAL:	M: F: TOTAL:	%	$	$	%
C	COMPLETIONS	M: F: TOTAL:	M: F: TOTAL:	%		$	
D	PLACEMENTS	M: F: TOTAL:	M: F: TOTAL:	%		$	
E	COMPOSITE (SUMS)						
F	AVERAGE (E÷3)			%			
G	PERFORMANCE INDICATOR (F3÷B6x100)		%				
H	COST EFFECTIVENESS INDICATOR (F3÷B5)						
A	COST	$	$	DATE:			
B	ENROLLMENTS	M: F: TOTAL:	M: F: TOTAL:	%	$	$	%
C	COMPLETIONS	M: F: TOTAL:	M: F: TOTAL:	%		$	
D	PLACEMENTS	M: F: TOTAL:	M: F: TOTAL:	%		$	
E	COMPOSITE (SUMS)						
F	AVERAGE (E÷3)			%			
G	PERFORMANCE INDICATOR (F3÷B6x100)		%				
H	COST EFFECTIVENESS INDICATOR (F3÷B5)						

VOCATIONAL EDUCATION PROGRAM ANALYSIS WORKSHEET

1977-78

1. Program/Service Title: Real Estate

2. USOE Program Code: 0 4 1 7 0 0

3. Program/Service Length: 2 years

4. Program/Service Location: Moorpark College

5. Program Enrollment: 1488
(Duplicated/Seats Taken All Voc Classes)

6. A.D.A. Generated: 135.6
(Round to one decimal point)

7. Income Generated: $ 186,327.9
(See table of A.D.A. components)

8. Planned Program Cost: $ 103,224.00

9. Actual Program Cost: $ 94,494.93

10. Cost Planning Effectiveness: 92 %
(Item 9 ÷ Item 8)

11. Unit Cost Per A.D.A.: $ 696.87
(Item 9 ÷ Item 6)

12. A.D.A. Program Effectiveness: 197 %
(Item 7 ÷ Item 9)

13. Duplicated/Unduplicated Enrollment Factor: 70 %
(14A ÷ 5)

	Planned	Actual	
14. Program Enrollment: (Unduplicated)	M 1064 F 298 Total 1362	M 782 F 260 Total 1042	15. Enrollment Planning Effectiveness: 77 % (14A ÷ 14P)
16. Program Completions: (Unduplicated)	M 57 F 22 Total 79	M 28 F 6 Total 34	17. Completions Planning Effectiveness: 43 % (16A ÷ 16P)
18. Program Placements: (Unduplicated)	M 35 F 14 Total 49	M 8 F 3 Total 11	19. Placement Planning Effectiveness: 22 % (18A ÷ 18P)

20. Planned Unit Cost: $ 75.79
(Unduplicated Enrollment - 8 ÷ 14P)

21. Actual Unit Cost: $ 90.69
(Unduplicated Enrollment - 9 ÷ 14A)

22. Unit Planning Performance: 120 %
(Unduplicated - 21 ÷ 20)

23. Completions Unit Cost: $ 2779.26
(9 ÷ 16A)

24. Placement Unit Cost: $ 8590.45
(9 ÷ 18A)

25. Unit Cost Performance: $ 3,039.32
(Duplicated & Unduplicated - 11 + 21 + 23 + 24 ÷ 4)

26. Composite: 234
(10 + 15 + 17 + 19)

27. Performance Indicator: 59 %
(26 ÷ 4)

28. Program Efficiency Indicator: 159
(12 + 22 ÷ 2)